



STIC Search Report

EIC 1700

STIC Database Tracking Number: 154292

TO: John Maples

Location: 6C89

Art Unit : 1745

May 24, 2005

Case Serial Number: 10/108148

From: Kathleen Fuller

Location: EIC 1700

REMSEN 4B28

Phone: 571/272-2505

Kathleen.Fuller@uspto.gov

Search Notes

=> FILE REG

FILE 'REGISTRY' ENTERED AT 14:58:30 ON 24 MAY 2005

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STRUCTURE FILE UPDATES: 23 MAY 2005 HIGHEST RN 850992-92-6

DICTIONARY FILE UPDATES: 23 MAY 2005 HIGHEST RN 850992-92-6

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 18, 2005

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*
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*

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more information enter HELP PROP at an arrow prompt in the file or refer to the file summary sheet on the web at:

<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> FILE HCAPLU

FILE 'HCAPLUS' ENTERED AT 14:58:35 ON 24 MAY 2005

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FILE COVERS 1907 - 24 May 2005 VOL 142 ISS 22

FILE LAST UPDATED: 23 May 2005 (20050523/ED)

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> D QUE L34

L7 SCR 2043
L12 SCR 1838 AND 2005
L14 SCR 1708
L16 STR

Ak@12

Cb-Cb
@8 @9

G1-O-G2-O-G1
2 3 4 5 6

Ak-SO3H
@10 11

VAR G1=10/12
VAR G2=CB/8-3 9-5
NODE ATTRIBUTES:
CONNECT IS E2 RC AT 10
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 8
GGCAT IS UNS AT 9
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 10

STEREO ATTRIBUTES: NONE

L18 26582 SEA FILE=REGISTRY SSS FUL L16 AND L7 AND L12 AND L14
L19 15917 SEA FILE=HCAPLUS ABB=ON L18
L26 8 SEA FILE=HCAPLUS ABB=ON L19(L)?SULFO?(L)ELECTROLYT?
L27 2253 SEA FILE=REGISTRY ABB=ON L18 AND 1-5/S
L28 1338 SEA FILE=HCAPLUS ABB=ON L27
L29 10 SEA FILE=HCAPLUS ABB=ON L28(L)ELECTROLYT?
L30 14 SEA FILE=HCAPLUS ABB=ON L26 OR L29
L31 83833 SEA FILE=HCAPLUS ABB=ON ?SULFO?(3A)(?ARYL? OR POLYPHENYL? OR
BIPHENYL? OR PHENYL? OR ?NAPHTHA? OR AROM?)
L32 357 SEA FILE=HCAPLUS ABB=ON L19 AND L31
L33 7 SEA FILE=HCAPLUS ABB=ON L32 AND ELECTROLYT?
L34 17 SEA FILE=HCAPLUS ABB=ON L30 OR L33

=> D L34 BIB ABS IND HITSTR 1-17

L34 ANSWER 1 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:340589 HCAPLUS
DN 142:393447
TI Proton-conductive polymer electrolytes, their films and their production
IN Nakano, Hiroko
PA Sumitomo Bakelite Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.

*query very broadly
Covers I, II or III.*

*III actually does not have
a Sulfonic acid group
which accounts for a
few of the weird answer.*

CODEN: JKXXAF

DT Patent

LA Japanese

FAN/CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 2005105176 | A2 | 20050421 | JP 2003-341992 | 20030930 |
| PRAI | JP 2003-341992 | | 20030930 | | |

AB The The electrolytes having high proton conductivity and maintained strength in low water content comprises a polymer containing a large ring compound having ionic dissociation group. Thus, 3 parts lauryl methacrylate-4-vinylimidazole copolymer was mixed with a tetrasodium 5,10,15,20-tetra(4-sulfonatophenyl)porphyrin cobalt complex (obtained from tetrasodium 5,10,15,20-tetra(4-sulfonatophenyl)porphyrin and cobalt acetate) 10 g in dichloromethane 50 mL, cast on a glass plate and dried at 40° to give a film, which soaked in 1 mol/L HCl aqueous solution for 12 h, showing ion exchange capacity 3.07 meq/g.

IC ICM C08F026-06

ICS C08F008-00; H01B001-06; H01B013-00; H01M008-02

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 52

ST proton conductive electrolyte polymer film

IT Metacyclophanes

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(calixarenes; proton-conductive polymer electrolytes for proton-conductive membranes)

IT Membranes, nonbiological

(elec. conductive, proton conductive; proton-conductive polymer electrolytes for proton-conductive membranes)

IT Ionic conductors

(proton conductors; proton-conductive polymer electrolytes for proton-conductive membranes)

IT Ion exchange membranes

Polymer electrolytes

(proton-conductive polymer electrolytes for proton-conductive membranes)

IT Porphyrins

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(proton-conductive polymer electrolytes for proton-conductive membranes)

IT 118338-93-5

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)

(preparation of proton-conductive polymer electrolytes for proton-conductive membranes)

IT 61004-83-9P 110242-20-1P 849770-17-8P 849770-18-9P

849770-19-0P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(proton-conductive polymer electrolytes for proton-conductive membranes)

IT 72282-44-1P 849770-21-4P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(proton-conductive polymer electrolytes for proton-conductive membranes)

IT 71-48-7, Cobalt acetate 79-10-7, Acrylic acid, reactions 107-07-3, Ethylene chlorohydrin, reactions 825-90-1, Sodium p-phenolsulfonate

30525-89-4, Paraformaldehyde 39050-26-5

RL: RCT (Reactant); RACT (Reactant or reagent)

(proton-conductive polymer electrolytes for proton-conductive membranes)

IT 849770-17-8P 849770-18-9P 849770-19-0P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(proton-conductive polymer electrolytes for proton-conductive membranes)

RN 849770-17-8 HCAPLUS

CN Poly(oxy-1,2-ethanediyl), $\alpha, \alpha', \alpha'', \alpha'''$ -

(5,11,17,23-tetrasulfopentacyclo[19.3.1.13,7.19,13.115,19]octacos-1(25),3,5,7(28),9,11,13(27),15,17,19(26),21,23-dodecaene-25,26,27,28-tetrayl)tetrakis[ω -hydroxy-, tetrasodium salt (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 849770-18-9 HCAPLUS

CN Poly(oxy-1,2-ethanediyl), $\alpha, \alpha', \alpha'', \alpha'''$ -

(5,11,17,23-tetrasulfopentacyclo[19.3.1.13,7.19,13.115,19]octacos-1(25),3,5,7(28),9,11,13(27),15,17,19(26),21,23-dodecaene-25,26,27,28-tetrayl)tetrakis[ω -(1-oxo-2-propenyl)oxy]-, tetrasodium salt (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 849770-19-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, dodecyl ester, polymer with

$\alpha, \alpha', \alpha'', \alpha'''$ - (5,11,17,23-tetrasulfopentacyclo[19.3.1.13,7.19,13.115,19]octacos-1(25),3,5,7(28),9,11,13(27),15,17,19(26),21,23-dodecaene-25,26,27,28-tetrayl)tetrakis[ω -(1-oxo-2-propenyl)oxy]poly(oxy-1,2-ethanediyl)] tetrasodium salt (9CI) (CA INDEX NAME)

CM 1

CRN 849770-18-9

CMF (C2 H4 O)n (C2 H4 O)n (C2 H4 O)n (C2 H4 O)n C40 H32 O20 S4 . 4 Na

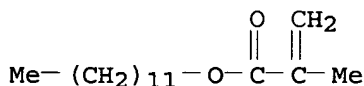
CCI PMS

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 142-90-5

CMF C16 H30 O2



IT 849770-21-4P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(proton-conductive polymer electrolytes for proton-conductive membranes)

RN 849770-21-4 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, dodecyl ester, polymer with

$\alpha, \alpha', \alpha'', \alpha'''$ - (5,11,17,23-tetrasulfopentacyclo[19.3.1.13,7.19,13.115,19]octacos-

1(25),3,5,7(28),9,11,13(27),15,17,19(26),21,23-dodecaene-25,26,27,28-tetrayl)tetrakis[ω-[(1-oxo-2-propenyl)oxy]poly(oxy-1,2-ethanediyl)] (9CI) (CA INDEX NAME)

CM 1

CRN 849770-20-3

CMF (C2 H4 O)n (C2 H4 O)n (C2 H4 O)n (C2 H4 O)n C40 H32 O20 S4

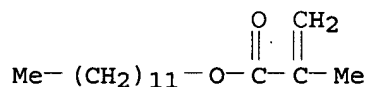
CCI PMS

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 142-90-5

CMF C16 H30 O2



L34 ANSWER 2 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2005:280908 HCAPLUS

DN 142:339074

TI Crosslinked sulfonated polyimides and their manufacture for polymer electrolyte membranes in fuel cells

IN Okamoto, Kenichi; Kita, Hidetoshi; Yamada, Nario; Yin, Yan; Hirano, Tetsuji; Kiuchi, Masayuki

PA Yamaguchi Technology Licensing Organization Ltd., Japan; Ube Industries, Ltd.

SO Jpn. Kokai Tokkyo Koho, 27 pp.

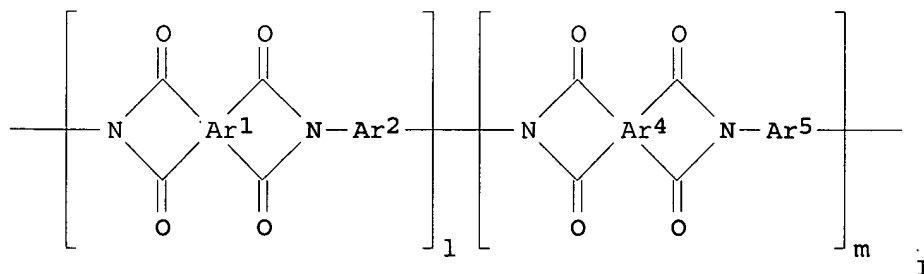
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 2005082726 | A2 | 20050331 | JP 2003-317413 | 20030909 |
| PRAI | JP 2003-317413 | | 20030909 | | |
| GI | | | | | |



AB The polyimides are crosslinked products of acid-terminated sulfonated polyimides I (Ar1, Ar4 = aromatic ring-containing tetravalent residue; Ar2 =

sulfo- or sulfo derivative-substituted divalent aromatic ring residue; Ar5 = sulfo- or sulfo derivative-free divalent aromatic ring residue; $l \geq 1$; $m \geq 0$) with ≥ 3 -functional aromatic amines. The polyimides are manufactured by (1) reacting Mb mol of aromatic diamines with Ma mol of aromatic tetracarboxylic acids in mol. ratio Ma/Mb 1.03-1.5 in organic solvents to give organic solvent-soluble aromatic tetracarboxylic acid residue-terminated sulfonated polyimides, (2) adding ≥ 3 -functional aromatic amines to the acid-terminated polyimide solns. at $\leq 100^\circ$ to satisfy approx. equal mol of the terminal acid residues and the amino groups, and (3) heating the mixts. at $110-350^\circ$ for removal of the solvents. Manufacture of films of the crosslinked sulfonated polyimides by casting or applying the mixts obtained by the above (2) process on supports and heating at $110-350^\circ$ for solvent removal is also claimed. The polyimides have high ion exchange capacity and proton conductivity and improved water resistance, dimensional change in water absorption, and MeOH permeability.

IC ICM C08G073-10
ICS C08J003-24; H01B001-06; H01M008-02; H01M008-10; C08L079-08

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST crosslinked sulfonated polyimide **electrolyte** membrane fuel cell

IT Polymer **electrolytes**
(crosslinked sulfonated polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

IT Fuel cells
(polymer **electrolyte**; crosslinked sulfonated polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

IT Polyimides, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfo-containing, aromatic amine-crosslinked; crosslinked sulfonated polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

IT 848469-45-4P 848469-47-6P 848469-48-7P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(crosslinked sulfonated polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

IT 108-73-6, 1,3,5-Trihydroxybenzene 350-46-9, 4-Fluoronitrobenzene
RL: RCT (Reactant); RACT (Reactant or reagent)
(crosslinker from; crosslinked sulfonated polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

IT 102852-92-6P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(crosslinker; crosslinked sulfonated polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

IT 696614-99-0P, Sodium 3-(3'-nitrophenoxy)propanesulfonate 696615-10-8P
696615-19-7P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(monomer from; crosslinked sulfonated polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

IT 88-75-5, o-Nitrophenol 554-84-7, m-Nitrophenol 55788-44-8, Sodium 3-bromopropanesulfonate
RL: RCT (Reactant); RACT (Reactant or reagent)
(monomer from; crosslinked sulfonated polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

IT 56716-06-4P 532967-92-3P, 2,2'-Bis(3-sulfopropoxy)benzidine

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(monomer; crosslinked sulfonated polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

IT 848469-45-4P 848469-47-6P 848469-48-7P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(crosslinked **sulfonated** polyimides and their manufacture for polymer **electrolyte** membranes in fuel cells)

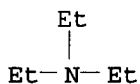
RN 848469-45-4 HCAPLUS

CN 1-Propanesulfonic acid, 3,3'-[(4,4'-diamino[1,1'-biphenyl]-2,2'-diyl)bis(oxy)]bis-, polymer with 4,4',4''-[1,3,5-benzenetriyltris(oxy)]tris[benzenamine] and [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone, compd. with N,N-diethylethanamine (9CI)
(CA INDEX NAME)

CM 1

CRN 121-44-8

CMF C6 H15 N



CM 2

CRN 848469-44-3

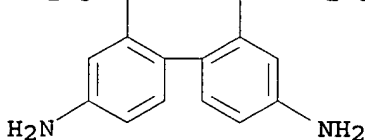
CMF (C24 H21 N3 O3 . C18 H24 N2 O8 S2 . C14 H4 O6)x

CCI PMS

CM 3

CRN 532967-92-3

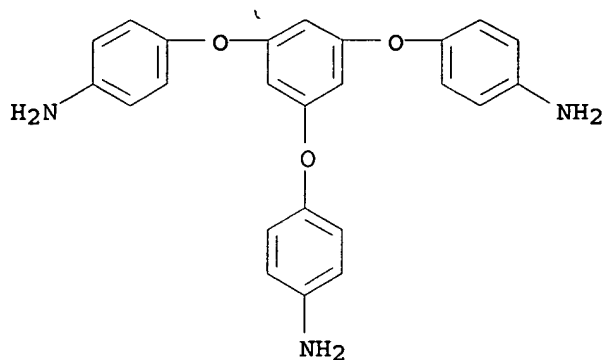
CMF C18 H24 N2 O8 S2



CM 4

CRN 102852-92-6

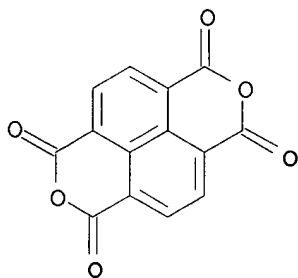
CMF C24 H21 N3 O3



CM 5

CRN 81-30-1

CMF C14 H4 O6



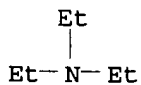
RN 848469-47-6 HCAPLUS

CN 1-Propanesulfonic acid, 3,3'-[(4,4'-diamino[1,1'-biphenyl]-2,2'-diyl)bis(oxy)]bis-, polymer with 4,4',4''-[1,3,5-benzenetriyltris(oxy)]tris[benzenamine], [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone and 4,4'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis[benzenamine], compd. with N,N-diethylethanamine (9CI)
(CA INDEX NAME)

CM 1

CRN 121-44-8

CMF C6 H15 N



CM 2

CRN 848469-46-5

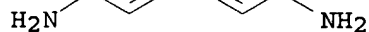
CMF (C24 H21 N3 O3 . C24 H20 N2 O2 . C18 H24 N2 O8 S2 . C14 H4 O6)x

CCI PMS

CM 3

CRN 532967-92-3

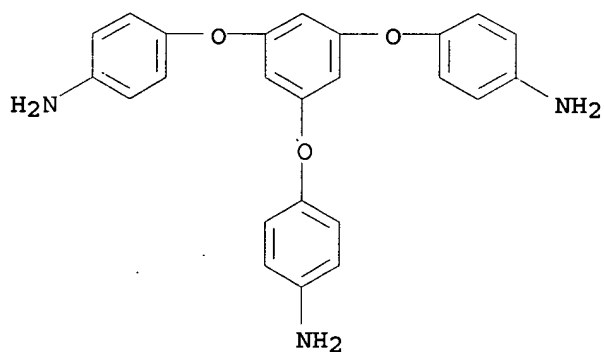
CMF C18 H24 N2 O8 S2



CM 4

CRN 102852-92-6

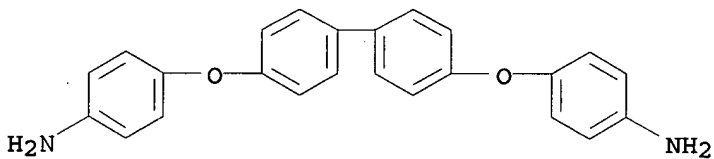
CMF C24 H21 N3 O3



CM 5

CRN 13080-85-8

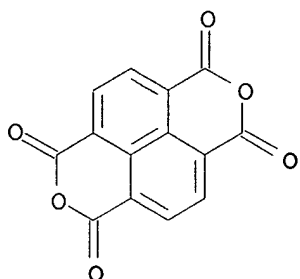
CMF C24 H20 N2 O2



CM 6

CRN 81-30-1

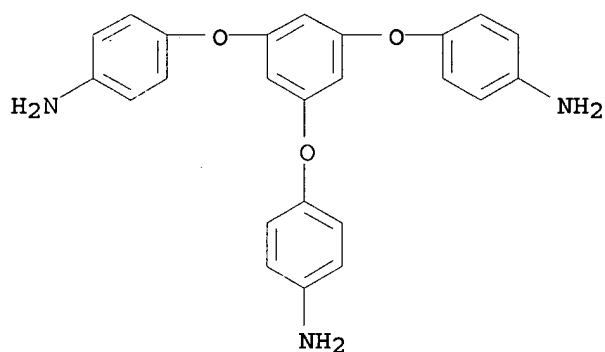
CMF C14 H4 O6



RN 848469-48-7 HCAPLUS
 CN 1-Propanesulfonic acid, 3,3'-[(4,4'-diamino[1,1'-biphenyl]-3,3'-diyl)bis(oxy)]bis-, polymer with 4,4',4''-[1,3,5-benzenetriyltris(oxy)]tris[benzenamine] and [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone (9CI) (CA INDEX NAME)

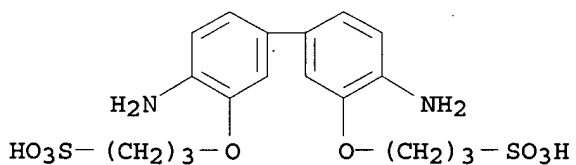
CM 1

CRN 102852-92-6
 CMF C24 H21 N3 O3



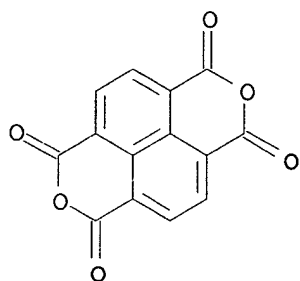
CM 2

CRN 56716-06-4
 CMF C18 H24 N2 O8 S2



CM 3

CRN 81-30-1
 CMF C14 H4 O6



L34 ANSWER 3 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2005:54375 HCAPLUS

DN 142:117696

TI Sulfonic acid group-containing polyimide films showing high proton conductivity and polymer electrolyte fuel cells using them

IN Matsuda, Aiko; Mizoguchi, Akira

PA Sumitomo Electric Industries, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 25 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 2005015541 | A2 | 20050120 | JP 2003-179236 | 20030624 |
| PRAI | JP 2003-179236 | | 20030624 | | |
| GI | | | | | |

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The films comprise polyimides including fluorenylene-containing structural repeating units I, and SO₃H-containing structural repeating units II and/or III (Ar₁, Ar₂ = ≥1-SO₃H-substituted bivalent organic group; X, Y = CZ₂, O, S, NH, NR; R = alkyl; Z = H, halo; m, n ≥ 0) at I/(II and/or III) molar ratio 5/95-95/5. The films show high mech. strength under dry and wet conditions, and suppress dimensional change in water absorption.

IC ICM C08G073-10

ICS C08J005-22; H01B001-06; H01M008-02; H01M008-10; C08L079-08

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38

ST sulfonic acid polyimide film electrolyte fuel cell; sulfo fluorene polyimide electrolyte fuel cell; proton conductor sulfonic acid polyimide film

IT Fuel cells

(polymer electrolyte; sulfonic acid group-containing polyimide films showing high proton conductivity and mech. strength for polymer electrolyte fuel cells)

IT Ionic conductors

(polymeric; sulfonic acid group-containing polyimide films showing high proton conductivity and mech. strength for polymer electrolyte fuel cells)

IT Polyimides, uses

RL: DEV (Device component use); IMF (Industrial manufacture); TEM

(Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfo-containing, ionomers; sulfonic acid group-containing polyimide films showing high proton conductivity and mech. strength for polymer electrolyte fuel cells)

IT Fuel cell electrolytes

Polymer electrolytes

(sulfonic acid group-containing polyimide films showing high proton conductivity and mech. strength for polymer electrolyte fuel cells)

IT 823177-64-6P 823177-66-8P

RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfonic acid group-containing polyimide films showing high proton conductivity and mech. strength for polymer electrolyte fuel cells)

IT 823177-66-8P

RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfonic acid group-containing polyimide films showing high proton conductivity and mech. strength for polymer electrolyte fuel cells)

RN 823177-66-8 HCAPLUS

CN 1-Butanesulfonic acid, 4,4'-[(4,4'-diamino[1,1'-biphenyl]-2,2'-diyl)bis(oxy)]bis-, polymer with [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone (9CI) (CA INDEX NAME).

CM 1

CRN 823177-65-7

CMF C20 H28 N2 O8 S2

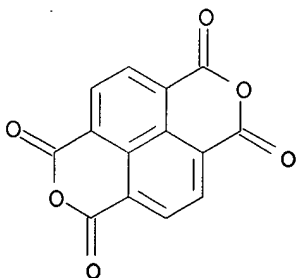


X

CM 2

CRN 81-30-1

CMF C14 H4 O6



L34 ANSWER 4 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:1058760 HCAPLUS

DN 142:41479

TI Electrolyte membrane filled with polymers and its use in fuel cell

IN Hiraoka, Hideki; Kubota, Kozo; Yamaguchi, Takehisa

PA Toa Gosei Chemical Industry Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|------|----------|-----------------|----------|
| PI | JP 2004349034 | A2 | 20041209 | JP 2003-142803 | 20030521 |
| PRAI | JP 2003-142803 | | 20030521 | | |
| AB | The membrane has epoxy compound- or oxetanyl compound-containing crosslinked polymers filled in micropores of a porous substrate (e.g., polyolefin), wherein the polymers have ion exchange groups. The membrane has high resistance to MeOH permeation and swelling when used in a direct MeOH-type fuel cell. | | | | |
| IC | ICM H01M008-02 | | | | |
| | ICS C08G059-14; C08G065-321; C08J009-36; H01B001-06; H01M008-10; C08L023-00 | | | | |
| CC | 52-2 (Electrochemical, Radiational, and Thermal Energy Technology) | | | | |
| | Section cross-reference(s): 38 | | | | |
| ST | ion exchange group polymer electrolyte membrane fuel cell; epoxy polymer ion exchange group fuel cell electrolyte; oxetanyl polymer ion exchange group fuel cell electrolyte | | | | |
| IT | Fuel cell electrolytes | | | | |
| | Polymer electrolytes | | | | |
| | (electrolyte membrane filled with ion exchange group-containing epoxy or oxetanyl polymers for fuel cell) | | | | |
| IT | Polyolefins | | | | |
| | RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses) | | | | |
| | (porous membrane substrate; electrolyte membrane filled with ion exchange group-containing epoxy or oxetanyl polymers for fuel cell) | | | | |
| IT | Epoxy resins, uses | | | | |
| | RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) | | | | |
| | (sulfonated; electrolyte membrane filled with ion exchange group-containing epoxy or oxetanyl polymers for fuel cell) | | | | |
| IT | 9002-88-4, Polyethylene | | | | |
| | RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses) | | | | |
| | (crosslinked, porous membrane substrate; electrolyte membrane filled with ion exchange group-containing epoxy or oxetanyl polymers for fuel cell) | | | | |
| IT | 803745-75-7DP, sulfonated | | | | |
| | RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) | | | | |
| | (electrolyte membrane filled with ion exchange group-containing epoxy or oxetanyl polymers for fuel cell) | | | | |
| IT | 146717-34-2DP, sulfonated 803745-76-8DP, sulfonated | | | | |
| | 804499-68-1DP, sulfonated | | | | |
| | RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) | | | | |
| | (electrolyte membrane filled with ion exchange group-containing epoxy or oxetanyl polymers for fuel cell) | | | | |
| IT | 106220-70-6, Adeka Optomer SP 150 | | | | |

RL: CAT (Catalyst use); USES (Uses)
 (photoacid generator, polymerization with; electrolyte membrane filled with
 ion exchange group-containing epoxy or oxetanyl polymers for fuel cell)

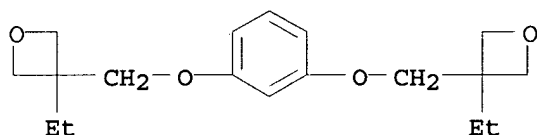
IT 931-36-2, 2-Ethyl-4-methylimidazole
 RL: CAT (Catalyst use); USES (Uses)
 (polymerization with; electrolyte membrane filled with ion exchange
 group-containing epoxy or oxetanyl polymers for fuel cell)

IT **804499-68-1DP, sulfonated**
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material
 use); PREP (Preparation); USES (Uses)
 (electrolyte membrane filled with ion exchange group-containing
 epoxy or oxetanyl polymers for fuel cell)

RN 804499-68-1 HCAPLUS
 CN Oxetane, 3,3'-[1,3-phenylenebis(oxymethylene)]bis[3-ethyl-, polymer with
 3-ethyl-3-(phenoxyethyl)oxetane (9CI). (CA INDEX NAME)

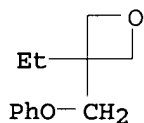
CM 1

CRN 111090-66-5
 CMF C18 H26 O4



CM 2

CRN 3897-65-2
 CMF C12 H16 O2



L34 ANSWER 5 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:756764 HCAPLUS
 DN 141:261463
 TI Amine-cured type epoxy resin electrolyte having a sulfonic acid group and --
 method for preparation thereof
 IN Akiyama, Eiichi; Kawakami, Takashi; Ito, Hitoshi; Yokota, Hiroshi
 PA Ebara Corporation, Japan
 SO PCT Int. Appl., 62 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|--|------|----------|-----------------|----------|
| PI | WO 2004078822 | A1 | 20040916 | WO 2004-JP2571 | 20040302 |
| | W: AE, AE, AG, AL, AL, AM, AM, AM, AT, AT, AU, AZ, AZ, BA, BB, BG, | | | | |

BG, BR, BR, BW, BY, BY, BZ, BZ, CA, CH, CN, CN, CO, CO, CR, CR,
 CU, CU, CZ, CZ, DE, DE, DK, DK, DM, DZ, EC, EC, EE, EE, EG, ES,
 ES, FI, FI, GB, GD, GE, GE, GH, GM, HR, HR, HU, HU, ID, IL, IN,
 IS, KE, KE, KG, KG, KP, KP, KP, KR, KR, KZ, KZ, KZ, LC, LK, LR,
 LS, LS, LT, LU, LV, MA, MD, MD, MG, MK, MN, MW, MX, MX, MZ, MZ,
 NA, NI, NI, NO

RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE,
 BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU,
 MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA,
 GN, GQ, GW, ML, MR, NE, SN, TD, TG, BF, BJ, CF, CG, CI, CM, GA,
 GN, GQ, GW, ML, MR, NE, SN, TD, TG

JP 2004263153 A2 20040924 JP 2003-57730 20030304

PRAI JP 2003-57730 A 20030304

AB Provided are a sulfonic-acid-containing amine-cured type epoxy resins;
 electrolyte or electrolyte membrane containing the resin; method for
 preparation

thereof; electrochem. device using the membrane. The electrolyte and
 electrolyte membrane according to the present invention have electrolyte
 properties such as ion conductivity enough for use in electrochem. devices,
 have

heat resistance and mech. strength, and can be prepared at a low cost. In
 addition, bonding or adhesion to electrodes is excellent owing to suppressed
 swelling of the membrane when impregnated with a solvent. An electrolyte
 was prepared from 2,2-bis(4-glycidyloxyphenyl)propane, triethylenetetramine,
 and 1,3-propanesultone.

IC ICM C08G059-50

ICS C08G059-14; C08J005-22; H01M006-18; H01M008-10

CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 76

ST amine cured sulfonate contg epoxy resin electrolyte

IT Conducting polymers

Electrolytes

(amine-cured type epoxy resin electrolyte having a sulfonic acid group
 and method for preparation thereof)

IT Electric apparatus

(electrochem.; amine-cured type epoxy resin electrolyte having a
 sulfonic acid group and method for preparation thereof)

IT Membranes, nonbiological

(electrolyte; amine-cured type epoxy resin electrolyte having a
 sulfonic acid group and method for preparation thereof)

IT Epoxy resins, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(sulfonic-acid-containing, amine-cured; amine-cured type epoxy resin
 electrolyte having a sulfonic acid group and method for preparation thereof)

IT 756901-59-4P

RL: IMF (Industrial manufacture); PREP (Preparation)

(amine-cured type epoxy resin electrolyte having a sulfonic acid group
 and method for preparation thereof)

IT 16146-59-1P, 1,5-Bis(4-hydroxyphenoxy)pentane 27184-40-3P 29239-84-7P

41481-62-3P 73310-55-1P 105359-67-9P 105646-18-2P 756901-60-7P

756901-61-8P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
 (Reactant or reagent)

(amine-cured type epoxy resin electrolyte having a sulfonic acid group
 and method for preparation thereof)

IT 1120-71-4DP, 1,3-Propanesultone, reaction products with

2,2-bis(4-glycidyloxyphenyl)propane-triethylenetetramine copolymer

1633-83-6DP, reaction products with 2,2-bis(4-glycidyloxyphenyl)propane-

triethylenetetramine copolymer 27615-34-5DP, reaction products with

1,3-propanesultone 33659-99-3DP, reaction products with

1,3-propanesultone 73310-55-1DP, reaction products with
 1,3-propanesultone 110302-44-8DP, reaction products with
 1,3-propanesultone 114556-66-0DP, reaction products with
 1,3-propanesultone 129388-49-4DP, reaction products with
 1,3-propanesultone 192199-60-3DP, reaction products with
 1,3-propanesultone 194224-76-5DP, reaction products with
 1,3-propanesultone 401594-86-3DP, reaction products with
 1,3-propanesultone 640732-03-2DP, reaction products with
 1,3-propanesultone 756901-62-9DP, reaction products with
 1,3-propanesultone 756901-65-2DP, reaction products with
 1,3-propanesultone 756901-66-3DP, reaction products with
 1,3-propanesultone 756901-67-4DP, reaction products with
 1,3-propanesultone 756901-68-5DP, reaction products with
 1,3-propanesultone 756901-69-6DP, reaction products with
 1,3-propanesultone 756901-70-9DP, reaction products with
 1,3-propanesultone 756901-71-0DP, reaction products with
 1,3-propanesultone 756901-72-1DP, reaction products with
 1,3-propanesultone 756901-73-2DP, reaction products with
 1,3-propanesultone 756901-74-3DP, reaction products with
 1,3-propanesultone 756901-75-4DP, reaction products with
 1,3-propanesultone 756901-76-5DP, reaction products with
 1,3-propanesultone 756901-78-7DP, reaction products with
 1,3-propanesultone 756901-79-8DP, reaction products with
 1,3-propanesultone 756901-80-1DP, reaction products with
 1,3-propanesultone 756901-81-2DP, reaction products with
 1,3-propanesultone 756901-82-3DP, reaction products with
 1,3-propanesultone

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(amine-cured type epoxy resin **electrolyte** having a **sulfonic acid group** and method for preparation thereof)

IT 92-88-6, 4,4'-Diphenol 101-80-4, 4,4'-Diaminodiphenyl ether 103-16-2,
 4-(Benzyloxy)phenol 106-89-8, Epichlorohydrin, reactions 111-24-0,
 1,5-Dibromopentane 13080-85-8, 4,4'-Bis(4-aminophenoxy)-biphenyl
 19249-03-7, Triethylene glycol di-p-tosylate

RL: RCT (Reactant); RACT (Reactant or reagent)

(amine-cured type epoxy resin **electrolyte** having a **sulfonic acid group** and method for preparation thereof)

IT 756901-67-4DP, reaction products with 1,3-propanesultone
 756901-68-5DP, reaction products with 1,3-propanesultone
 756901-74-3DP, reaction products with 1,3-propanesultone

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(amine-cured type epoxy resin **electrolyte** having a **sulfonic acid group** and method for preparation thereof)

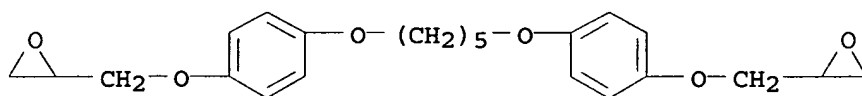
RN 756901-67-4 HCAPLUS

CN 1,2-Ethanediamine, N,N'-bis(2-aminoethyl)-, polymer with
 2,2'-[1,5-pentanedibis(oxy-4,1-phenyleneoxymethylene)]bis[oxirane] (9CI)
 (CA INDEX NAME)

CM 1

CRN 756901-59-4

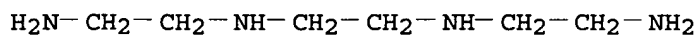
CMF C23 H28 O6



CM 2

CRN 112-24-3

CMF C6 H18 N4



RN 756901-68-5 HCAPLUS

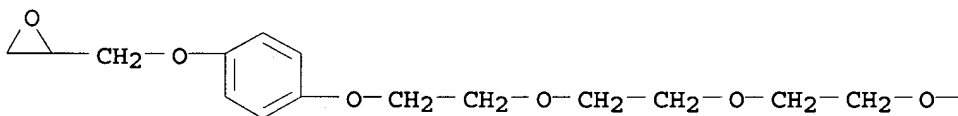
CN 1,2-Ethanediamine, N,N'-bis(2-aminoethyl)-, polymer with
2,2'-[1,2-ethanediylbis(oxy-2,1-ethanediyl oxy-4,1-phenyleneoxymethylene)]bis[oxirane] (9CI) (CA INDEX NAME)

CM 1

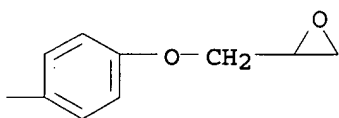
CRN 27184-40-3

CMF C24 H30 O8

PAGE 1-A



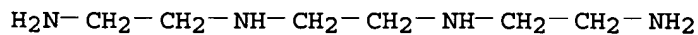
PAGE 1-B



CM 2

CRN 112-24-3

CMF C6 H18 N4

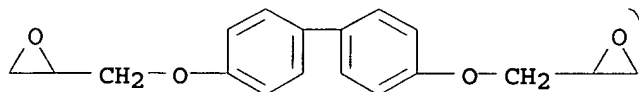


RN 756901-74-3 HCAPLUS

CN 1,2-Ethanediamine, N,N'-bis(2-aminoethyl)-, polymer with
2,2'-[[1,1'-biphenyl]-4,4'-diylbis(oxy-methylene)]bis[oxirane] (9CI) (CA
INDEX NAME)

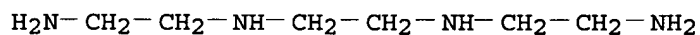
CM 1

CRN 2461-46-3
CMF C18 H18 O4



CM 2

CRN 112-24-3
CMF C6 H18 N4



RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 6 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:700578 HCAPLUS

DN 141:210090

TI **Sulfonated** fluorine-containing **polyaryl** ethers, their compositions, moldings, and polymer **electrolyte** membranes

IN Sakaguchi, Yoshimitsu; Kitamura, Kota; Nagahara, Shigenori; Omote, Kazushi; Nishichi, Ai; Asako, Yoshinobu

PA Toyobo Co., Ltd., Japan; Nippon Shokubai Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 35 pp.

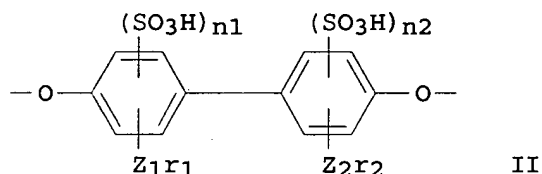
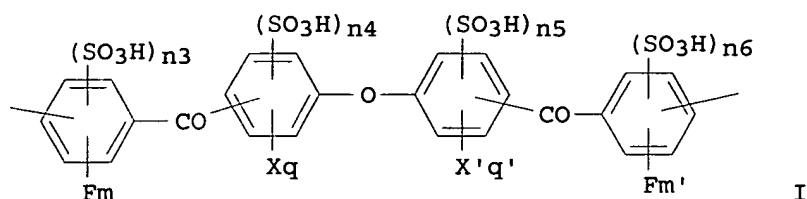
CODEN: JKXXAF

DT Patent

LA Japanese

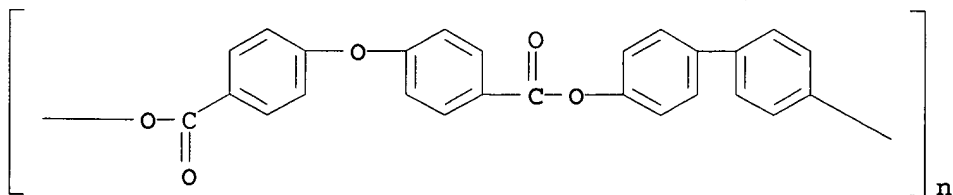
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---------------|------|----------|-----------------|----------|
| | ----- | ---- | ----- | ----- | ----- |
| PI | JP 2004238424 | A2 | 20040826 | JP 2003-26294 | 20030203 |
| PRAI | JP 2003-26294 | | 20030203 | | |
| GI | | | | | |



- AB The polyarylethers have repeating units of I [$m, m' = 0-4, (m + m') = 1-8$; $X, X' = \text{halo, C1-6 lower alk(ox)yl}$; $q, q' = 0-4$; $n1-n6 = 0-2, (n1 + n2 + n3 + n4 + n5 + n6) = 1-12$; $(n3 + m) \leq 4, (n4 + q) \leq 4, (n5 + q') \leq 4, (n6 + m') \leq 4$] and II [$Z1, Z2 = \text{C1-6 lower alkyl, alkoxyl, carboxyl, carbonyl, nitro, amino, OH, halo}$; $r1, r2 = 0-4$; $(n1 + r1) \leq 4, (n2 + r2) \leq 4$], and/or repeating units of III and IV [$s = 1, 2$; $n7, n8, n9 = 0-2, (n7 + n8 + n9) = 1-6$; $Z3, Z4 = \text{C1-6 lower alkyl, alkoxyl, carboxyl, carbonyl, nitro, amino, OH, halo}$; $r3, r4 = 0-4$; $(n7 + r3) \leq 4, (n8 + r4) \leq 4$]. The membranes, useful for fuel cell **electrolytes**, have desirable amts. of sulfonic acid groups, and show improved ionic conductivity and heat resistance.
- IC ICM C08G065-48
ICS H01B001-06; H01M008-02; H01M008-10
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST **sulfonated** fluoropolymer **polyarylether** molding
electrolyte membrane; fuel cell **electrolyte** polyether
polyketone fluoropolymer **sulfonated**; hydroxyphenyl hexafluoropropane
pentafluorobenzoyl diphenyl biphenol polymer **sulfonated**
- IT Heat-resistant materials
(films; **sulfonated** F-containing **polyarylethers** for
polymer **electrolyte** membranes with good durability)
- IT Polyethers, uses
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(fluorine-containing, **sulfonated**; **sulfonated** F-containing
polyarylethers for polymer **electrolyte** membranes
with good durability)
- IT Films
(heat-resistant; **sulfonated** F-containing **polyarylethers**
ethers for polymer **electrolyte** membranes with good
durability)
- IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, fluorine-containing, **sulfonated**; **sulfonated**
F-containing **polyarylethers** for polymer **electrolyte**
membranes with good durability)
- IT Fluoropolymers, uses
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)

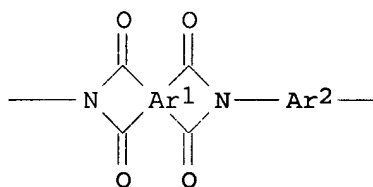
- (polyether-, **sulfonated**; **sulfonated** F-containing **polyaryyl** ethers for polymer **electrolyte** membranes with good durability)
- IT Fluoropolymers, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-polyketone-, **sulfonated**; **sulfonated** F-containing **polyaryyl** ethers for polymer **electrolyte** membranes with good durability)
- IT Polyethers, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-, fluorine-containing, **sulfonated**; **sulfonated** F-containing **polyaryyl** ethers for polymer **electrolyte** membranes with good durability)
- IT Ionic conductors
 (polymeric; **sulfonated** F-containing **polyaryyl** ethers for polymer **electrolyte** membranes with good durability)
- IT Fuel cell **electrolytes**
 Membranes, nonbiological
 Polymer **electrolytes**
 (**sulfonated** F-containing **polyaryyl** ethers for polymer **electrolyte** membranes with good durability)
- IT Molded plastics, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (**sulfonated** F-containing **polyaryyl** ethers for polymer **electrolyte** membranes with good durability)
- IT 115967-58-3DP, **sulfonated** 744229-28-5DP, **sulfonated** 744229-29-6DP, **sulfonated** 744229-30-9DP, **sulfonated**
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (**sulfonated** F-containing **polyaryyl** ethers for polymer **electrolyte** membranes with good durability)
- IT 744229-28-5P 744229-29-6P 744229-30-9P 745793-70-8P
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (**sulfonated** F-containing **polyaryyl** ethers for polymer **electrolyte** membranes with good durability)
- IT 115967-58-3DP, **sulfonated**
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (**sulfonated** F-containing **polyaryyl** ethers for polymer **electrolyte** membranes with good durability)
- RN 115967-58-3 HCAPLUS
 CN Poly(oxycarbonyl-1,4-phenyleneoxy-1,4-phenylenecarbonyloxy[1,1'-biphenyl]-4,4'-diyl) (9CI) (CA INDEX NAME)



AN 2004:450890 HCAPLUS
 DN 141:8327
 TI **Sulfoalkoxylated aromatic polyimides for electrolyte membranes**
 IN Okamoto, Kenichi; Kita, Hidetoshi; Feng, Chien-Hua; Hirano, Tetsuji; Kiuchi, Masayuki; Ueda, Masahiro; Nakamura, Kazumasa
 PA Yamaguchi T.L.O. Y. K., Japan; Ube Industries, Ltd.; Shinyei Kaisha
 SO Jpn. Kokai Tokkyo Koho, 23 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 2004155998 | A2 | 20040603 | JP 2002-325440 | 20021108 |
| PRAI | JP 2002-325440 | | 20021108 | | |

GI



I

AB The **sulfoalkoxylated aromatic polyimides**, useful for fuel cell **electrolytes**, ion-exchange membranes, gas sensors, etc., have repeating units represented by I [Ar1 = aromatic ring-containing tetravalent group; Ar2 = [C6R4-k[O(CH2)nSO3X]k]m; R = H, C1-2 alkyl; m = 1-2; n = 1-6; k = 1-2; X = H, alkali metal, ammonium, quaternary amine]. Thus, 3-(2',4'-diaminophenoxy)propane sulfonic acid monohydrochloride-1,4,5,8-naphthalenetetracarboxylic dianhydride copolymer polyimide film showed good water resistance, high proton conductivity, and low methanol permeability.

IC ICM C08G073-10
 ICS C08J005-22; H01B001-06; H01M008-02; H01M008-10; C08L079-08

CC 38-3 (Plastics Fabrication and Uses)
 Section cross-reference(s): 25, 52, 76

ST **sulfoalkoxylated arom polyimide electrolyte**
 proton conductor; fuel cell **electrolyte** gas sensor polyimide membrane; ion exchange membrane sulfoalkoxylated polyimide **electrolyte**; aminophenoxypropane **sulfonic naphthalenetetracarboxylate** polyimide film water resistance

IT Water-resistant materials
 (films, **electrolyte** membranes; **sulfoalkoxylated aromatic polyimides** for water-resistant **electrolyte** membranes)

IT Ionic conductors
 (polymeric; **sulfoalkoxylated aromatic polyimides** for water-resistant **electrolyte** membranes)

IT Fuel cell **electrolytes**
 Gas sensors
 Ion exchange membranes
 Polymer **electrolytes**
 (**sulfoalkoxylated aromatic polyimides** for water-resistant **electrolyte** membranes)

IT Polyimides, uses
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (sulfoalkoxylated aromatic polyimides for water-resistant electrolyte membranes)

IT Films
 (water-resistant, electrolyte membranes;
 sulfoalkoxylated aromatic polyimides for water-resistant electrolyte membranes)

IT 56716-06-4P 405066-50-4P 532967-92-3P 597544-23-5P 696614-99-0P
 696615-10-8P 696615-19-7P
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (sulfoalkoxylated aromatic polyimides for water-resistant electrolyte membranes)

IT 597544-25-7P 599179-63-2P 648900-41-8P 648900-42-9P
 696615-46-0P 696615-57-3P 696615-88-0P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (sulfoalkoxylated aromatic polyimides for water-resistant electrolyte membranes)

IT 51-28-5, 2,4-Dinitrophenol, reactions 88-75-5, o-Nitrophenol 554-84-7, m-Nitrophenol 55788-44-8, Sodium 3-bromopropanesulfonate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfoalkoxylated aromatic polyimides for water-resistant electrolyte membranes)

IT 648900-41-8P 648900-42-9P 696615-46-0P
 696615-57-3P 696615-88-0P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (sulfoalkoxylated aromatic polyimides for water-resistant electrolyte membranes)

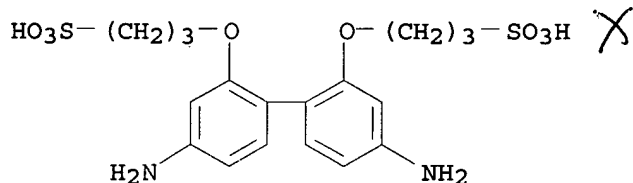
RN 648900-41-8 HCAPLUS

CN 1-Propanesulfonic acid, 3,3'-[(4,4'-diamino[1,1'-biphenyl]-2,2'-diyl)bis(oxy)]bis-, polymer with [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone (9CI) (CA INDEX NAME)

CM 1

CRN 532967-92-3

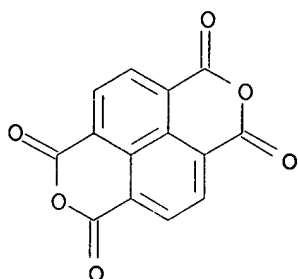
CMF C18 H24 N2 O8 S2



CM 2

CRN 81-30-1

CMF C14 H4 O6

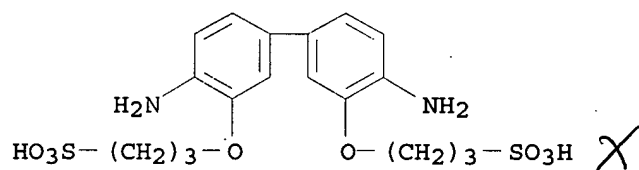


RN 648900-42-9 HCAPLUS
 CN 1-Propanesulfonic acid, 3,3'-[(4,4'-diamino[1,1'-biphenyl]-3,3'-diyl)bis(oxy)]bis-, polymer with [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone (9CI) (CA INDEX NAME)

CM 1

CRN 56716-06-4

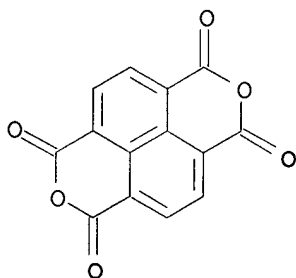
CMF C18 H24 N2 O8 S2



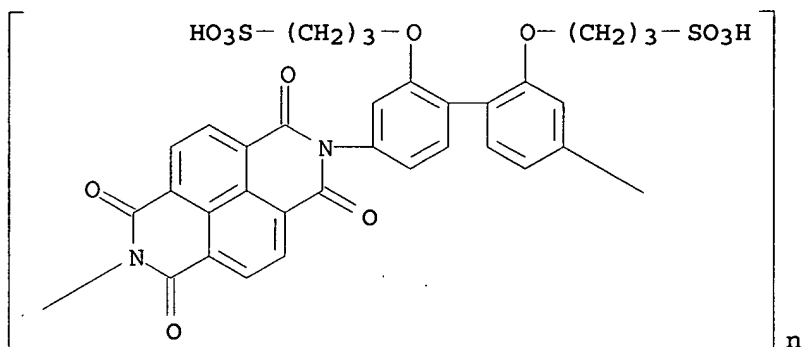
CM 2

CRN 81-30-1

CMF C14 H4 O6



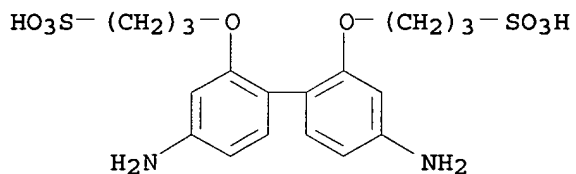
RN 696615-46-0 HCAPLUS
 CN Poly[(1,3,6,8-tetrahydro-1,3,6,8-tetraoxobenzo[lmn][3,8]phenanthroline-2,7-diyl)[2,2'-bis(3-sulfopropoxy)[1,1'-biphenyl]-4,4'-diyl]] (9CI) (CA INDEX NAME)



RN 696615-57-3 HCAPLUS
 CN 1-Propanesulfonic acid, 3,3'-[(4,4'-diamino[1,1'-biphenyl]-2,2'-diyl)bis(oxy)]bis-, polymer with 1,3-benzenediamine and [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone (9CI) (CA INDEX NAME)

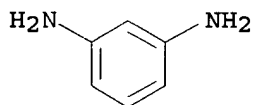
CM 1

CRN 532967-92-3
 CMF C18 H24 N2 O8 S2



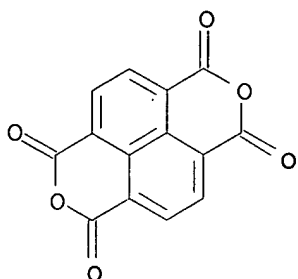
CM 2

CRN 108-45-2
 CMF C6 H8 N2

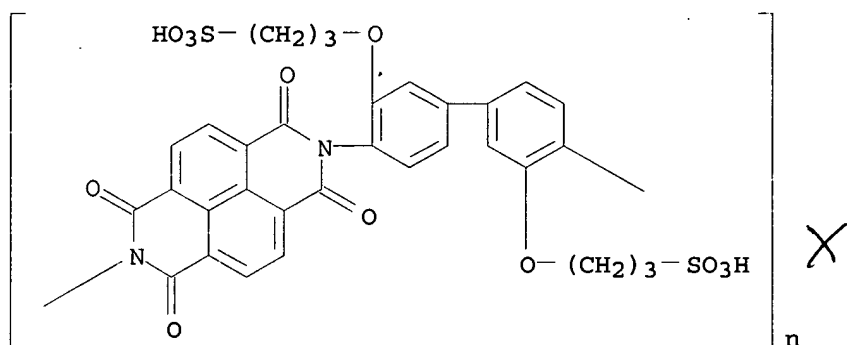


CM 3

CRN 81-30-1
 CMF C14 H4 O6

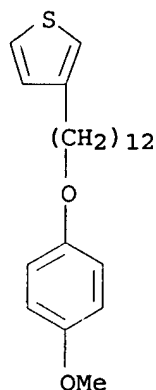


RN 696615-88-0 HCAPLUS
 CN Poly[(1,3,6,8-tetrahydro-1,3,6,8-tetraoxobenzo[lmn][3,8]phenanthroline-2,7-diyl)[3,3'-bis(3-sulfopropoxy)[1,1'-biphenyl]-4,4'-diyl]] (9CI) (CA INDEX NAME)



L34 ANSWER 8 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:397559 HCAPLUS
 DN 141:113977
 TI Solid-state electrochromic device based on two poly(thiophene) derivatives
 AU Ribeiro, A. S.; Machado, D. A.; Faria dos Santos Filho, P.; De Paoli, M.-A.
 CS Laboratorio de Polimeros Condutores e Reciclagem, Instituto de Quimica, Sao Paulo, 13084-971, Brazil
 SO Journal of Electroanalytical Chemistry (2004), 567(2), 243-248
 CODEN: JECHES
 PB Elsevier
 DT Journal
 LA English
 AB A solid-state electrochromic device was assembled using a polymer electrolyte and optically transparent electrodes modified with thin films of poly{3-[12-(p-methoxyphenoxy)dodecyl]thiophene} and poly(3,4-ethylenedioxythiophene) doped with poly(styrenesulfonate). Poly(epichlorohydrin-co-ethylene oxide) containing LiClO4 was used as the polymer electrolyte. After assembling, the device was studied by spectroelectrochem. techniques. The best performance of this device could be obtained by adjusting the relative thickness of the active polymer films and the potential range of operation of the device. The device shows color variation during ca. 500 charge/discharge cycles and can be constructed under atmospheric conditions. The results obtained suggest a multitude of perspectives in applications in electrochromic displays.
 CC 74-9 (Radiation Chemistry, Photochemistry, and Photographic and Other

Reprographic Processes)
 Section cross-reference(s): 73
 ST electrochromic device polythiophene deriv
 IT Epichlorohydrin rubber
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (epichlorohydrin-ethylene oxide, electrolyte; solid-state
 electrochromic device using polymer electrolyte and transparent
 electrodes modified with poly(thiophene) derivs.)
 IT Electrochromic imaging devices
 Polymer electrolytes
 Thickness
 (solid-state electrochromic device using polymer electrolyte and
 transparent electrodes modified with poly(thiophene) derivs.)
 IT Electrochemistry
 (spectroelectrochem.; solid-state electrochromic device using polymer
 electrolyte and transparent electrodes modified with poly(thiophene)
 derivs.)
 IT 126213-51-2, Poly(3,4-ethylenedioxythiophene)
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (doped with poly(styrenesulfonate), electrode; solid-state
 electrochromic device using polymer electrolyte and transparent
 electrodes modified with poly(thiophene) derivs.)
 IT 24969-10-6, Ethylene oxide-epichlorohydrin copolymer
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (elastomeric, electrolyte; solid-state electrochromic device using
 polymer electrolyte and transparent electrodes modified with
 poly(thiophene) derivs.)
 IT 693775-72-3
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (electrode; solid-state electrochromic device using polymer
 electrolyte and transparent electrodes modified with
 poly(thiophene) derivs.)
 IT 7791-03-9, Lithium perchlorate
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (electrolyte; solid-state electrochromic device using polymer
 electrolyte and transparent electrodes modified with poly(thiophene)
 derivs.)
 IT 721435-18-3
 RL: MOA (Modifier or additive use); USES (Uses)
 (poly(ethylenedioxythiophene) doped with; solid-state electrochromic
 device using polymer electrolyte and transparent electrodes modified
 with poly(thiophene) derivs.)
 IT 693775-72-3
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (electrode; solid-state electrochromic device using polymer
 electrolyte and transparent electrodes modified with
 poly(thiophene) derivs.)
 RN 693775-72-3 HCAPLUS
 CN Thiophene, 3-[12-(4-methoxyphenoxy)dodecyl]-, homopolymer (9CI) (CA INDEX
 NAME)
 CM 1
 CRN 693775-71-2
 CMF C23 H34 O2 S



RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 9 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:20161 HCAPLUS

DN 140:79789

TI Polymer electrolytes showing high ion conductivity at low temperature and secondary lithium batteries

IN Ito, Takahito; Yamamoto, Osamu; Fujinami, Tatsuo

PA Toyota Motor Corp., Japan; Genesis Research Institute Inc.

SO Jpn. Kokai Tokkyo Koho, 27 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 2004006237 | A2 | 20040108 | JP 2003-2423 | 20030108 |
| PRAI | JP 2002-107035 | A | 20020409 | | |

AB The electrolytes contain base polymers, highly-branched oligoethylene oxide polymers, mixed oxides, and Li salts. The batteries having electrolyte containing the base polymers, the oligoethylene oxide polymers, mixed oxides, and composite Li salts suppress reaction of the electrolytes with current collectors, e.g., Al, achieving good performance at low and high temps.

IC ICM H01M010-40

ICS H01B001-06; H01B001-12; H01M004-02; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38

ST polyoxyethylene lithium complex battery electrolyte; polybistriethylene glycol benzoate electrolyte lithium battery; polyether polyester dendrimer electrolyte lithium battery; barium titanium oxide lithium battery polymer electrolyte; lithium fluorosulfonylimide polyoxyethylene electrolyte battery; ionic conductor highly branched polymer electrolyte

IT Battery cathodes

(containing boroxins in polymer electrolyte binders; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)

IT Polyoxyalkylenes, uses

RL: DEV (Device component use); USES (Uses)

(lithium complex, trifluoromethanesulfonylimide-containing; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)

- IT Polyoxyalkylenes, uses
 RL: DEV (Device component use); USES (Uses)
 (lithium complexes; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)
- IT Secondary batteries
 (lithium; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)
- IT Polyoxyalkylenes, uses
 RL: DEV (Device component use); USES (Uses)
 (polyester-, dendrimers, lithium complexes, trifluoromethanesulfonylimide-containing; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)
- IT Dendritic polymers
 RL: DEV (Device component use); USES (Uses)
 (polyester-polyoxyalkylene-, lithium complexes, trifluoromethanesulfonylimide-containing; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)
- IT Battery electrolytes
 Ionic conductors
 Polymer electrolytes
 (polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)
- IT Polyesters, uses
 RL: DEV (Device component use); USES (Uses)
 (polyoxyalkylene-, dendrimers, lithium complexes, trifluoromethanesulfonylimide-containing; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)
- IT 289-56-5D, Boroxin, trialkyl derivative
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
 (additives for polymer electrolyte binders in cathodes; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)
- IT 21324-40-3, Lithium hexafluorophosphate 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide 132843-44-8, Lithium bis(pentafluoroethylsulfonyl)imide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (complex with polyethylene glycol and highly-branched poly[bis(triethylene glycol) benzoate] acetate; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)
- IT 7439-93-2D, Lithium, trifluoromethanesulfonate-containing, complex with polyethylene glycol and highly-branched poly[bis(triethylene glycol) benzoate] acetate 9003-11-6D, Ethylene oxide-propylene oxide copolymer, lithium complexes 25322-68-3D, Polyethylene glycol, lithium complex, trifluoromethanesulfonylimide-containing 25322-69-4D, Polypropylene glycol, lithium complexes 239798-54-0D, lithium complex, trifluoromethanesulfonylimide-containing
 RL: DEV (Device component use); USES (Uses)
 (polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)
- IT 12047-27-7, Barium titanium oxide (BaTiO₃), uses
 RL: DEV (Device component use); MOA (Modifier or additive use); USES

(Uses)

(polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)

IT 12003-67-7, Aluminum lithium oxide (AlLiO₂)

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(α- or γ-; polymer electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)

IT 239798-54-0D, lithium complex, trifluoromethanesulfonylimide*

** -containing

RL: DEV (Device component use); USES (Uses)

(polymer ***electrolytes containing highly-branched oligoethylene oxide polymers, mixed mixed oxides, and Li salts for secondary lithium batteries)

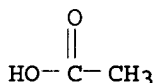
RN 239798-54-0 HCAPLUS

CN Benzoic acid, 3,5-bis[2-(2-(2-hydroxyethoxy)ethoxy)ethoxy]-, homopolymer, acetate (9CI) (CA INDEX NAME)

CM 1

CRN 64-19-7

CMF C2 H4 O2



CM 2

CRN 239798-53-9

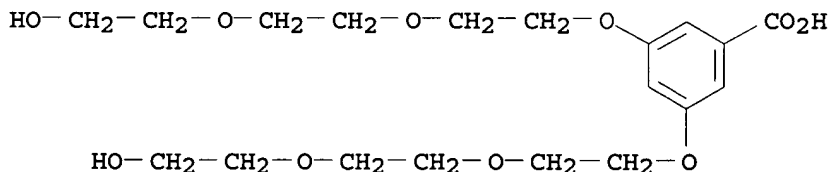
CMF (C19 H30 O10)x

CCI PMS

CM 3

CRN 239798-52-8

CMF C19 H30 O10



L34 ANSWER 10 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:658701 HCAPLUS

DN 140:130980

TI Sulfonated polyimides for polymer electrolyte membrane fuel cell

AU Okamoto, Ken-ichi

CS Department of Advanced Materials Science and Engineering, Faculty of Engineering, Yamaguchi University, Yamaguchi, 755-8611, Japan

- SO Journal of Photopolymer Science and Technology (2003), 16(2), 247-254
CODEN: JSTEED; ISSN: 0914-9244
- PB Technical Association of Photopolymers, Japan
- DT Journal
- LA English
- AB Two types of novel sulfonated diamines bearing sulfonic acid groups directly bonded to polyimide main chains (main-chain type) or in the side alkoxy chains (side-chain type), and the corresponding sulfonated polyimides were successfully synthesized. Water vapor sorption, proton conductivity σ , methanol permeability PM, membrane stability toward hot water, and size change with water uptake of the sulfonated polyimide membranes were studied. The membranes of sulfonated polyimides prepared from the proper mol. design showed much better water stability and higher proton conductivity compared with the conventional polyimides based on 2,2'-benzidinedisulfonic acid. They also displayed the higher ratio of σ over PM than Nafion 117 membrane. They might have potential for polymer electrolyte fuel cell and methanol direct fuel cell applications.
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76
- ST sulfonated polyimide polymer electrolyte membrane fuel cell proton cond; water swelling absorption polyimide polymer ion exchange capacity membrane
- IT Electric current-potential relationship
(of cells with these membranes; sulfonated polyimides for polymer electrolyte membrane fuel cell)
- IT Polyimides, preparation
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polyether-, sulfonated; sulfonated polyimides for polymer electrolyte membrane fuel cell)
- IT Polyimides, preparation
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polyether-, sulfonated polyimides for polymer electrolyte membrane fuel cell)
- IT Polyethers, preparation
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polyimide-, sulfonated; sulfonated polyimides for polymer electrolyte membrane fuel cell)
- IT Polyethers, preparation
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polyimide-, sulfonated polyimides for polymer electrolyte membrane fuel cell)
- IT Ionic conductivity
(proton; sulfonated polyimides for polymer electrolyte membrane fuel cell)
- IT Permeability
(selective; sulfonated polyimides for polymer electrolyte membrane fuel cell)
- IT Fuel cell separators
Ion exchange
Ion exchange membranes
Polyelectrolytes
(sulfonated polyimides for polymer electrolyte membrane fuel cell)
- IT Swelling, physical
(with water; sulfonated polyimides for polymer electrolyte membrane fuel cell)
- IT 302924-87-4P 648900-41-8P 648900-42-9P
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(sulfonated polyimides for polymer electrolyte membrane fuel cell)

IT 196309-83-8P 455944-29-3P 455944-36-2P 500295-68-1P 500295-69-2P
545389-73-9P 648900-38-3P 648900-40-7P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(sulfonated polyimides for polymer electrolyte membrane fuel cell)

IT 648900-41-8P 648900-42-9P

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP
(Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC
(Process)

(sulfonated polyimides for polymer electrolyte
membrane fuel cell)

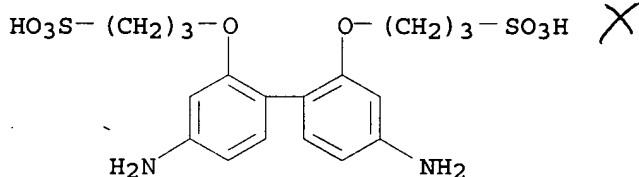
RN 648900-41-8 HCAPLUS

CN 1-Propanesulfonic acid, 3,3'-[(4,4'-diamino[1,1'-biphenyl]-2,2'-
diyl)bis(oxy)]bis-, polymer with [2]benzopyrano[6,5,4-def][2]benzopyran-
1,3,6,8-tetrone (9CI) (CA INDEX NAME)

CM 1

CRN 532967-92-3

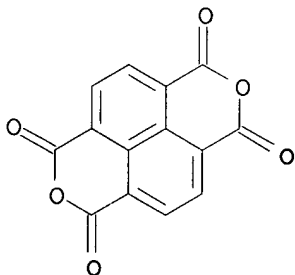
CMF C18 H24 N2 O8 S2



CM 2

CRN 81-30-1

CMF C14 H4 O6



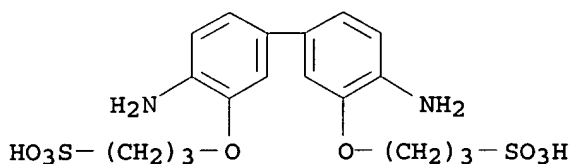
RN 648900-42-9 HCAPLUS

CN 1-Propanesulfonic acid, 3,3'-[(4,4'-diamino[1,1'-biphenyl]-3,3'-
diyl)bis(oxy)]bis-, polymer with [2]benzopyrano[6,5,4-def][2]benzopyran-
1,3,6,8-tetrone (9CI) (CA INDEX NAME)

CM 1

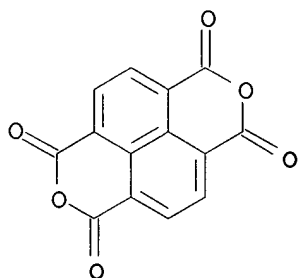
CRN 56716-06-4

CMF C18 H24 N2 O8 S2



CM 2

CRN 81-30-1
CMF C14 H4 O6



RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 11 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:492509 HCAPLUS
DN 139:55473
TI Solid polymer **electrolyte** and ion-exchange resin for
electrochemical devices
IN Morishima, Makoto; Kamo, Tomoichi; Kobayashi, Toshiyuki; Yamaga, Kenji;
Koyama, Tohru
PA Japan
SO U.S. Pat. Appl. Publ., 16 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

applicant

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | US 2003118886 | A1 | 20030626 | US 2002-81148 | 20020225 |
| | JP 2003187826 | A2 | 20030704 | JP 2001-388200 | 20011220 |
| | CA 2373212 | AA | 20030620 | CA 2002-2373212 | 20020225 |
| | US 2003129467 | A1 | 20030710 | US 2002-176606 | 20020624 |
| PRAI | JP 2001-388200 | A | 20011220 | | |
| | US 2002-81148 | A1 | 20020225 | | |

AB The object of this invention is to provide a solid polymer **electrolyte** which is excellent in durability and of low cost, and membranes, solns. for electrode catalyst coating, membrane/electrode assemblies and fuel cells which use the **electrolyte**. Gas supply passages to the anode and to the cathode are provided according to this invention, there can be provided a fuel cell which comprises an electrode assembly having an electrode catalyst membrane formed therein, the catalyst membrane comprising a polymer **electrolyte** membrane held

between an anode on one side of the principal plane of the **electrolyte** membrane and a cathode on the other side of the principal lane thereof, current collecting plates provided each independently in close contact, to the anode side and the cathode side of the electrode assembly, and electroconductive separators having gas supply passages to the anode and to the cathode provided on the outside surfaces of the current collecting plates.

- IC ICM H01M008-10
- ICS H01M004-86
- INCL 429033000; 521025000; 429042000; 429044000
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72, 76
- ST polymer **electrolyte** ion exchange resin electrochem device; fuel cell polymer **electrolyte** ion exchange resin; electrolyzer polymer **electrolyte** ion exchange resin; sensor polymer **electrolyte** ion exchange resin
- IT Polyphenyls
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(copolymers; solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)
- IT Catalysts
(electrocatalysts; solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)
- IT Polymerization
(oxidative coupling; solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)
- IT Fuel gas manufacturing
(reforming; solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)
- IT Fuel cells
(solid **electrolyte**; solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)
- IT **Electrolytic cells**
Fuel cell **electrolytes**
Gas sensors
Hygrometers
Ion exchangers
Polymer **electrolytes**
(solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)
- IT Platinum alloy, base
RL: DEV (Device component use); USES (Uses)
(solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)
- IT 7440-06-4, Platinum, uses
RL: DEV (Device component use); USES (Uses)
(solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)
- IT 121136-23-ODP, sulfobutoxylated 421549-88-4DP, Poly(2,6-dihydroxy-1,5-naphthalenediyl), sulfobutoxylated 544673-34-9P 544673-36-1P
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)
- IT 104-36-9P, 1,4-Di(butoxy)benzene 39800-63-0P, 4,4'-Dibutoxybiphenyl 121136-23-0P 421549-88-4P, Poly(2,6-dihydroxy-1,5-naphthalenediyl) 544673-32-7P 544673-33-8P 544673-35-0P
RL: SPN (Synthetic preparation); PREP (Preparation)

(solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)

IT 1333-74-0P, Hydrogen, uses
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)

IT 544673-34-9P 544673-36-1P
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(solid polymer **electrolyte** and ion-exchange resin for electrochem. devices)

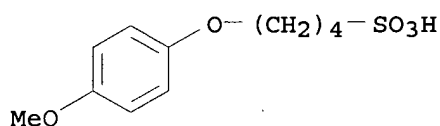
RN 544673-34-9 HCAPLUS

CN 1-Butanesulfonic acid, 4,4'-[1,4-phenylenebis(oxy)]bis-, sodium salt, polymer with 1,4-dibutoxybenzene and sodium 4-(4-methoxyphenoxy)-1-butanefulfonate (9CI) (CA INDEX NAME)

CM 1

CRN 544673-33-8

CMF C11 H16 O5 S . Na

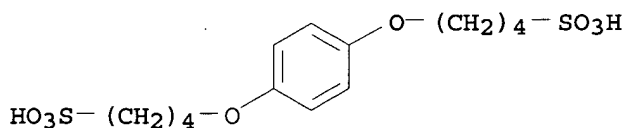


● Na

CM 2

CRN 544673-32-7

CMF C14 H22 O8 S2 . x Na

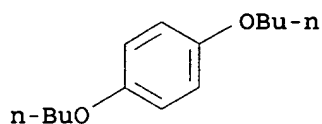


●x Na

CM 3

CRN 104-36-9

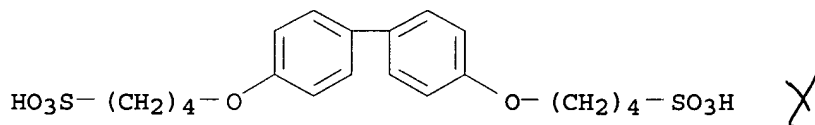
CMF C14 H22 O2



RN 544673-36-1 HCAPLUS
 CN 1-Butanesulfonic acid, 4,4'-[[1,1'-biphenyl]-4,4'-diylbis(oxy)]bis-, sodium salt, polymer with 4,4'-dibutoxy-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

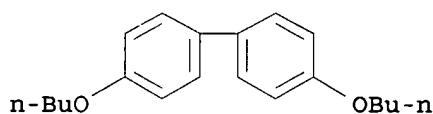
CRN 544673-35-0
 CMF C20 H26 O8 S2 . x Na



● x Na

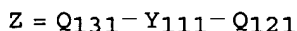
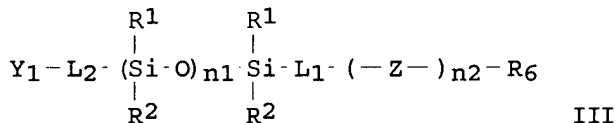
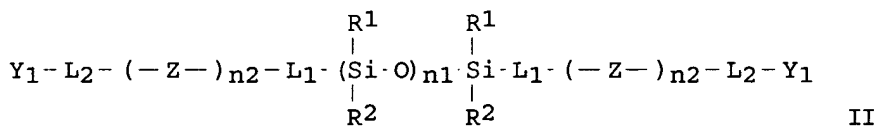
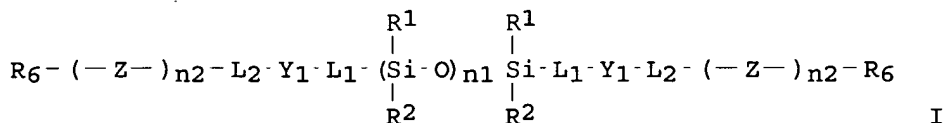
CM 2

CRN 39800-63-0
 CMF C20 H26 O2



L34 ANSWER 12 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:673113 HCAPLUS
 DN 137:219505
 TI Electrolyte composition, battery, photoelectrochemical cell, secondary nonaqueous electrolyte battery, and liquid crystal compounds
 IN Ono, Michio; Yasuda, Takayasu; Wariishi, Koji
 PA Fuji Photo Film Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 32 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|-------------------|------|----------|-----------------|----------|
| PI | JP 2002251916 | A2 | 20020906 | JP 2001-47041 | 20010222 |
| PRAI | JP 2001-47041 | | 20010222 | | |
| OS | MARPAT 137:219505 | | | | |
| GI | | | | | |



AB The electrolyte contains a liquid crystal compound having cation and/or anion containing repeating units $-(\text{SiR}_1\text{R}_2-\text{O})_{n1}$, where R1 and R2 = (substituted) alkyl groups, $n1 \geq 3$. The liquid crystal compound is I, II, or III, where the R6 = H or a substituent group, Y111= bivalent (4-7)- membered ring, Q121 and Q131 = bivalent junction group or single bond, $n2 = 1, 2$, or 3, ($n = 2$ or 3 the ≥ 1 of Y111, Q121, or Q131 in the compound can be different from each other), and X1 is the counter ion for Y1. Batteries, secondary nonaq. batteries, and photoelectrochem. cells use the electrolyte.

IC ICM H01B001-06

ICS C08L083-04; H01M010-40; H01M014-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary battery electrolyte liq crystal compd; photoelectrochem cell electrolyte liq crystal compd

IT Battery electrolytes

Liquid crystals

Photoelectrochemical cells

(comps. of electrolytes containing liquid crystal compds. for secondary lithium batteries and photoelectrochem. cells)

IT 311-28-4, Tetrabutylammonium iodide 14283-07-9, Lithium fluoroborate

65039-05-6 90076-65-6 455934-78-8 455934-80-2 455934-81-3

455934-83-5 455934-84-6 455934-85-7 455934-87-9 455934-88-0

455934-89-1 455934-90-4 455934-91-5 455934-93-7 **455934-95-9**

455934-97-1 455951-19-6 455951-26-5

RL: DEV (Device component use); USES (Uses)

(comps. of **electrolytes** containing liquid crystal compds. for secondary lithium batteries and photoelectrochem. cells)

IT **455934-95-9 455934-97-1**

RL: DEV (Device component use); USES (Uses)

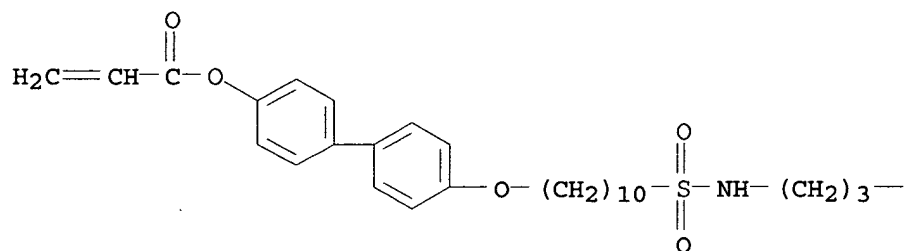
(comps. of **electrolytes** containing liquid crystal compds. for secondary lithium batteries and photoelectrochem. cells)

RN 455934-95-9 HCAPLUS

CN Poly[oxy(dimethylsilylene)], α -[dimethyl[3-[[[10-[[4'-[(1-oxo-2-propenyl)oxy][1,1'-biphenyl]-4-yl]oxy]decyl]sulfonyl]amino]propyl]silyl]- ω -[[dimethyl[3-[[[10-[[4'-[(1-oxo-2-propenyl)oxy][1,1'-biphenyl]-4-yl]oxy]decyl]sulfonyl]amino]propyl]silyl]oxy]-, dilithium salt (9CI) (CA

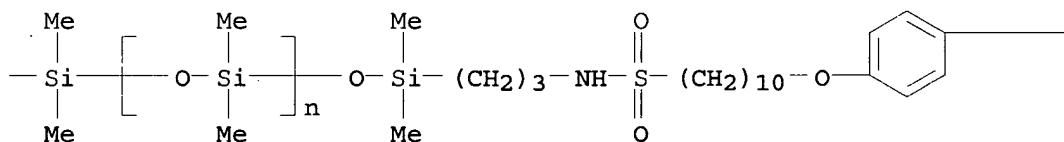
INDEX NAME)

PAGE 1-A

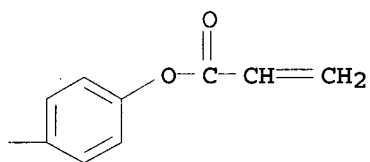


● 2 Li

PAGE 1-B



PAGE 1-C

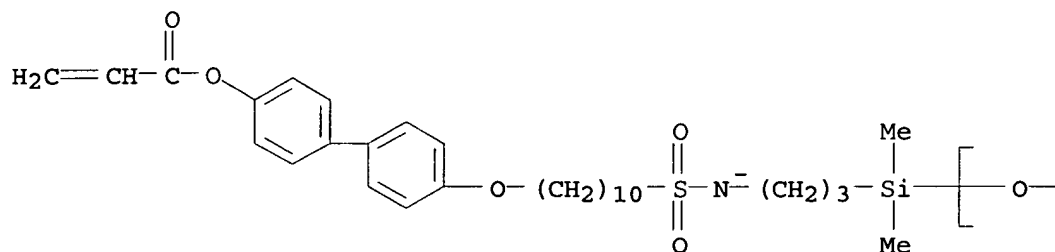


RN 455934-97-1 HCAPLUS
 CN 1H-Imidazolium, 1-butyl-3-methyl-, salt with α -[dimethyl[3-[[[10-[[4'-[(1-oxo-2-propenyl)oxy][1,1'-biphenyl]-4-yl]oxy]decyl]sulfonyl]amino]propyl]silyl]- ω -[[dimethyl[3-[[[10-[[4'-[(1-oxo-2-propenyl)oxy][1,1'-biphenyl]-4-yl]oxy]decyl]sulfonyl]amino]propyl]silyl]oxy]poly[oxy(dimethylsilylene)] (2:1) (9CI) (CA INDEX NAME)

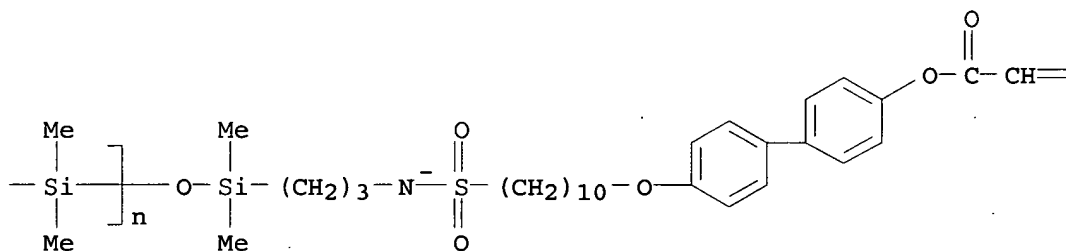
CM 1

CRN 455934-96-0
 CMF (C2 H6 O Si)n C60 H86 N2 O11 S2 Si2
 CCI PMS

PAGE 1-A



PAGE 1-B



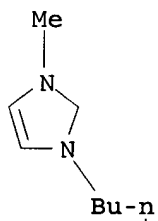
PAGE 1-C

=CH₂

CM 2

CRN 80432-08-2

CMF C8 H15 N2



ONE OR MORE TAUTOMERIC DOUBLE BONDS NOT DISPLAYED IN THE STRUCTURE

L34 ANSWER 13 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:409147 HCAPLUS

DN 136:408826

TI Organic electroluminescent devices containing electroconductive organic functional layers with uniform thickness and methods of manufacturing the

KATHLEEN FULLER EIC 1700 REMSON 4B28 571/272-2505

devices

IN Okada, Shinjiro; Tsuboyama, Akira; Takiguchi, Takao; Noguchi, Koji;
Moriyama, Takashi; Kamatani, Jun; Furugori, Manabu

PA Japan

SO U.S. Pat. Appl. Publ., 14 pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------------|------|----------|-----------------|-----------------|
| PI | <u>US 2002064683</u> | A1 | 20020530 | US 2001-995611 | <u>20011129</u> |
| | JP 2002231448 | A2 | 20020816 | JP 2001-361054 | 20011127 |
| PRAI | JP 2000-362117 | A | 20001129 | | |

AB Electroconductive devices are described which comprise an insulating substrate, a first electrode disposed on the insulating substrate, a thin layer of a chargeable material disposed in a plurality of regions on the first electrode, a layer of an electroconductive organic function material disposed on the thin layer of the chargeable material, and a second electrode disposed on the layer of the electroconductive organic function material. Processes for producing the electroconductive devices are discussed which entail applying a thin layer of a chargeable material onto a first electrode disposed on an insulating substrate; forming a layer of an electroconductive organic function material on the layer of the chargeable material by immersing the substrate in an electrolytic solution containing ions of the electroconductive organic function material to cause adsorption of the ions of the electroconductive organic function material onto the thin layer of the chargeable material; forming a second electrode on the layer of the electroconductive organic function material.

IC ICM H05B033-12

ICS H05B033-10

INCL 428690000

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 36, 66, 68, 74, 76

ST org electroluminescent device fabrication uniform thickness adsorption; electroconductive device manufg adsorption chargeable material

IT Electrolytes

(charging material; organic electroluminescent devices containing

luminescent

organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT Ink-jet printing

(coating of chargeable material using; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT Adsorption

(layer deposition using; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT Electric conductors

Electroluminescent devices

Electronic device fabrication

(organic electroluminescent devices containing electroconductive organic functional layers with uniform thickness and methods of manufacturing devices)

IT Luminescent substances

(organic electroluminescent devices containing luminescent organic layers

with

uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT 153986-30-2
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
 (anionic electrolytic solution containing; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT 50926-11-9, ITO
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
 (anode; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT 7429-90-5, Aluminum, uses 12615-41-7
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
 (cathode layer; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT 431063-00-2
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
 (cationic electrolytic solution containing; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT 2085-33-8, Alq3
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
 (electron-transporting layer; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT 179862-65-8
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
 (neg. chargeable material; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT 64-19-7, Acetic acid, uses 141-43-5, β -Aminoethyl alcohol, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (neutralization using; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

IT 431062-98-5
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
 (pos. chargeable material; organic electroluminescent devices prepared by adsorption of electroconductive organic material from solution onto thin layer of chargeable material)

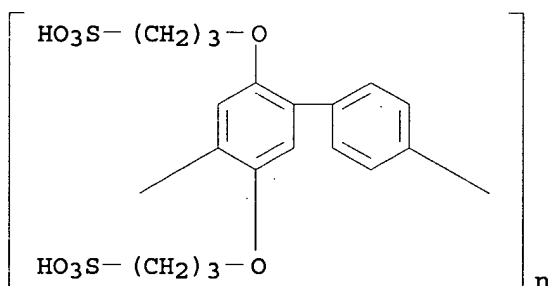
IT 153986-30-2

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)

(anionic **electrolytic** solution containing; organic electroluminescent devices containing luminescent organic layers with uniform thickness prepared by adsorption of electroconductive organic material onto thin layer of chargeable material)

RN 153986-30-2 HCAPLUS

CN Poly[2,5-bis(3-sulfopropoxy) [1,1'-biphenyl]-4,4'-diyl disodium salt] (9CI)
(CA INDEX NAME)



●2 Na

L34 ANSWER 14 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1999:768996 HCAPLUS

DN 132:79218

TI Novel cation conductors based on rigid-rod poly(p-phenylene)s

AU Baum, P.; Meyer, W. H.; Wegner, G.

CS Max-Planck-Institute for Polymer Research, Mainz, D-55021, Germany

SO Polymer (1999), Volume Date 2000, 41(3), 965-973

CODEN: POLMAG; ISSN: 0032-3861

PB Elsevier Science Ltd.

DT Journal

LA English

AB Self-assembling of sulfonate- and ethylene oxide-containing poly(p-phenylene)s (PPP) rigid rods was used to obtain layered structures as reinforcing elements separated by a liquid matrix of ethylene oxide (EO) side chains. Lithium salts were dissolved in the layered structure and the ion conductivity

of

the resulting polymer **electrolytes** was evaluated. Single-ion conductors with EO-side chains plus Li sulfonate groups attached to the PPP backbones exhibit low conductivity. Although the EO-side chain to Li sulfonate molar ratio was chosen so that the O/Li⁺ ratio is ≈ 25 , the d.c. conductivity of the material was approx. two orders of magnitude lower than that of PPP(EO)_{5/6}-lithium triflate blend with the same O/Li⁺ ratio. The conductivity decreases further when the EO-side chain to sulfonate ratio is decreased. Thus, the increase in the molar concentration of Li sulfonate does not lead to higher conductivity, either because the number of free, i.e.

mobile,

charge carriers is decreased or because the mobility of the ionic species is drastically reduced due to the lack of segmental motion of the matrix. Consequently, when the matrix is plasticized by the addition of large amts.

of oligoether, the ionic conductivity increases dramatically and becomes comparable to that of the corresponding multi-ion conducting SPE with the same O/Li+ ratio. The supramol. structures thus achieved are of interest for use as battery separators.

CC 37-5 (Plastics Manufacture and Processing)

Section cross-reference(s): 52, 72, 76

ST polyphenylene oligooxyalkylene lithium ion conductor polymer

electrolyte; sulfonate ethylene oxide

polyphenylene self assembly; ionic cond polyphenylene

sulfonate lithium salt

IT Polymer morphology

(layered structure; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT Supramolecular structure

(liquid phase/rigid phase; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT Electric current carriers

(mobility; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT Polyphenyls

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(oligooxyethylene; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT Polymer chains

(orientation; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT Polymer chains

(packing; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT Electric impedance

Glass transition temperature

Ionic conductivity

Plasticization

Polymer **electrolytes**

Secondary battery separators

Self-assembly

Solubility

(preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT Polymer chains

(side; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT 1310-65-2, Lithium hydroxide

RL: NUU (Other use, unclassified); USES (Uses)

(cation source; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT 143-24-8, Tetraethylene glycol dimethyl ether

RL: NUU (Other use, unclassified); USES (Uses)

(plasticizer; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT 7439-93-2P, Lithium, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polyoxyalkylene-**polyphenylene sulfonate** complexes;
preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side
chains and ionic conductivity of lithium composites for battery separators)

IT 253876-01-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(precursor polymer; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

IT 33454-82-9P, Lithium trifluoromethanesulfonate 253876-01-6DP,
de-arylated, lithium complexes and free sulfonic acids

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side
chains and ionic conductivity of lithium composites for battery separators)

IT 253876-01-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(precursor polymer; preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)

RN 253876-01-6 HCAPLUS

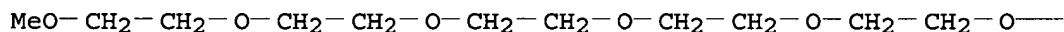
| | |
|----|---|
| CN | Benzenesulfonic acid, 2,5-dibromo-, 3,5-bis(1,1-dimethylethyl)phenyl ester, polymer with 19,19'-[(2,5-dibromo-1,4-phenylene)bis(oxy)]bis[2,5,8,11,14,17-hexaoxonadecane], 16,16'-[(2,5-dibromo-1,4-phenylene)bis(oxy)]bis[2,5,8,11,14-pentaoxahexadecane] and 2,2'-[(1,4-phenylene)bis[1,3,2-dioxaborinane] (9CI) (CA INDEX NAME) |
|----|---|

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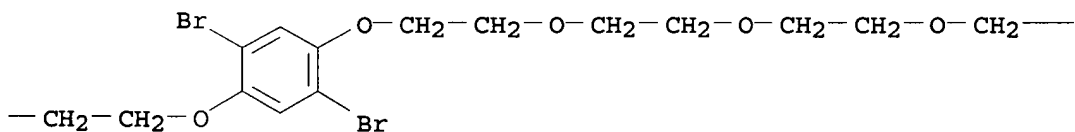
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CMF C32 H56 Br2 O14

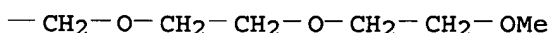
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PAGE 1-B



PAGE 1-C

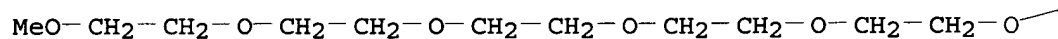


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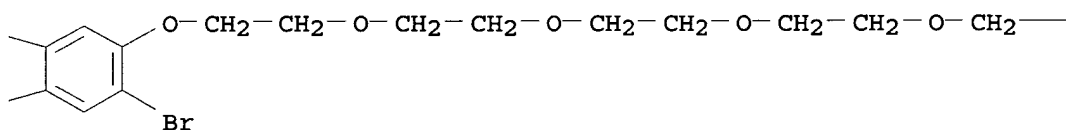
CRN 187754-81-0
CMF C28 H48 Br2 O12

PAGE 1-A

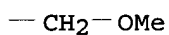
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PAGE 1-B

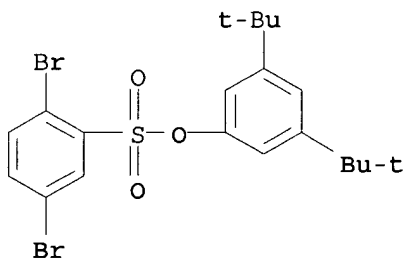


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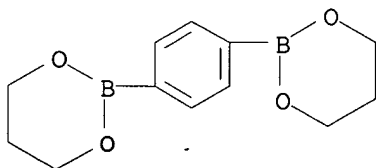
CM 3

CRN 180296-68-8
CMF C20 H24 Br2 O3 S



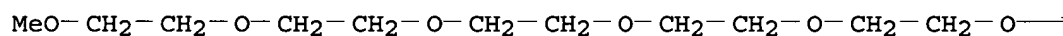
CM 4

CRN 96433-09-9
CMF C12 H16 B2 O4

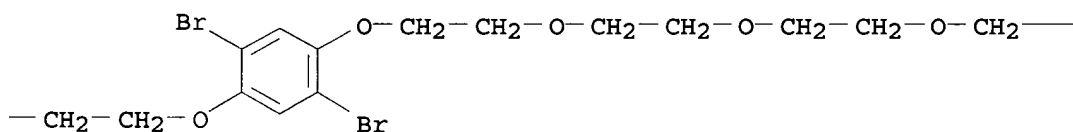


IT 253876-01-6DP, de-arylated, lithium complexes and free sulfonic acids
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (preparation of rigid-rod poly(p-phenylene)s with oligo(oxyethylene) side chains and ionic conductivity of lithium composites for battery separators)
 RN 253876-01-6 HCAPLUS
 CN Benzenesulfonic acid, 2,5-dibromo-, 3,5-bis(1,1-dimethylethyl)phenyl ester, polymer with 19,19'-[(2,5-dibromo-1,4-phenylene)bis(oxy)]bis[2,5,8,11,14,17-hexaoxonadecane], 16,16'-[(2,5-dibromo-1,4-phenylene)bis(oxy)]bis[2,5,8,11,14-pentaoxa-hexadecane] and 2,2'-(1,4-phenylene)bis[1,3,2-dioxaborinane] (9CI) (CA INDEX NAME)
 CM 1
 CRN 187754-84-3
 CMF C32 H56 Br2 O14

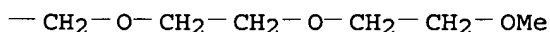
PAGE 1-A



PAGE 1-B



PAGE 1-C

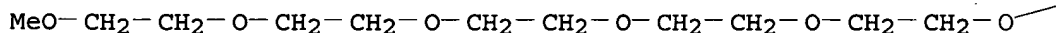


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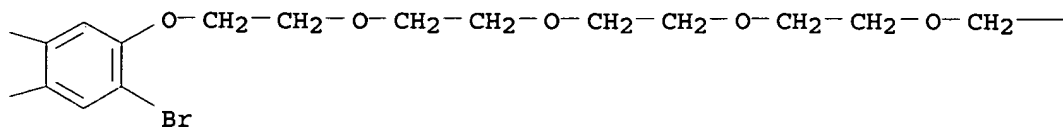
CRN 187754-81-0
 CMF C28 H48 Br2 O12

PAGE 1-A

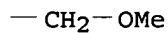
Br



PAGE 1-B



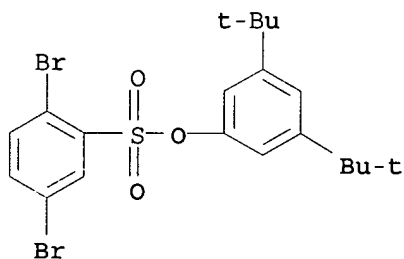
PAGE 1-C



CM 3

CRN 180296-68-8

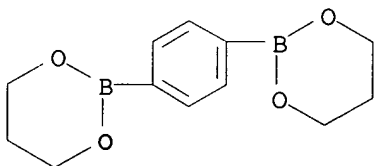
CMF C20 H24 Br2 O3 S



CM 4

CRN 96433-09-9

CMF C12 H16 B2 O4



RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 15 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1999:680831 HCAPLUS

DN 132:12699

TI Synthesis and optical properties of poly(p-phenylene) **electrolyte** attached with oligo(ethylene oxide) side chains

AU Kim, Kunsoo; Kim, Jeong Soo

CS Department of Polym. Sci. & Eng., Chungnam National Univ., Taejon, 305-764, S. Korea

SO Polymer (Korea) (1999), 23(5), 731-738

KATHLEEN FULLER EIC 1700 REMSON 4B28 571/272-2505

CODEN: POLLDG; ISSN: 0379-153X

PB Polymer Society of Korea

DT Journal

LA Korean

AB In order to synthesize poly(p-phenylene) containing the side chain of oligo(ethylene oxide), the derivs. of dichlorobenzene and dibromobenzene which are attached with oligo(ethylene oxides), were synthesized. The synthesized monomers were polymerized with the catalyst of nickel-complex, and the formation of polymers was confirmed by the spectroscopic method and viscosity measurement. The polymers were characterized using TGA, UV-visible absorbance, photoluminescence, and redox behavior in electrochem. cell.

CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 38, 73

ST optical polyphenylene **electrolyte** contg polyoxyethylene; photoluminescence polyphenylene **electrolyte** contg polyoxyethylene

IT Electric current-potential relationship
(light emitting electrochem. cell prepared from polyphenylene **electrolyte** attached with oligo(ethylene oxide) side chains)

IT Electroluminescent devices
(light emitting electrochem. cell prepared from polyphenylene **electrolyte** attached with oligo(ethylene oxide) side chains and)

IT Polyoxyalkylenes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(light emitting electrochem. cell prepared from polyphenylene **electrolyte** attached with oligo(ethylene oxide) side chains and)

IT Luminescence
(preparation and optical properties of polyphenylene **electrolyte** attached with oligo(ethylene oxide) side chains)

IT Polyphenyls
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and optical properties of polyphenylene **electrolyte** attached with oligo(ethylene oxide) side chains)

IT 58320-73-3P 62921-74-8P, Triethylene glycol monomethyl ether p-toluenesulfonate 79622-11-0P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(in preparation of polyphenylene **electrolytes** containing oligo(ethylene oxide) side chains)

IT 7429-90-5, Aluminum, properties 50926-11-9, ITO
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(light emitting electrochem. cell prepared from polyphenylene **electrolyte** attached with oligo(ethylene oxide) side chains and)

IT 7791-03-9 25322-68-3
RL: TEM (Technical or engineered material use); USES (Uses)
(light emitting electrochem. cell prepared from polyphenylene **electrolyte** attached with oligo(ethylene oxide) side chains and)

IT 251479-83-1P 251479-85-3P 251479-86-4P 251479-87-5P 251479-88-6P
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation and optical properties of)

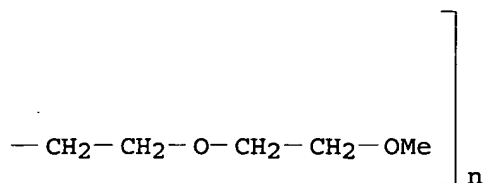
IT 197176-70-8P 251479-89-7P 251479-90-0P 251479-91-1P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and optical properties of)


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IT 187754-76-3P 251479-79-5P 251479-80-8P 251479-81-9P 251479-82-0P
    RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
        (Reactant or reagent)
        (preparation and polymerization of)
IT 98-59-9, p-Toluenesulfonyl chloride
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction with oligo(ethylene oxide))
IT 583-78-8, 2,5-Dichlorophenol 14753-51-6, 2,5-Dibromohydroquinone
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (reaction with oligo(ethylene oxide) monomethyl ether toluenesulfonate)
IT 112-35-6, Triethylene glycol monomethyl ether 4437-01-8, Heptaethylene
    glycol monomethyl ether 9004-74-4
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (toluenesulfonation of)
IT 197176-70-8P 251479-89-7P 251479-90-0P
    251479-91-1P
    RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
        (preparation and optical properties of)
RN 197176-70-8 HCAPLUS
CN Benzene, 1,4-dibromo-2,5-bis[2-[2-(2-methoxyethoxy)ethoxy]ethoxy]-,
    homopolymer (9CI) (CA INDEX NAME)

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PAGE 1-B



RN 251479-90-0 HCAPLUS

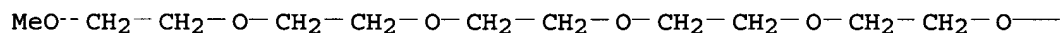
CN 2,5,8,11,14,17,20-Heptaoxadocosane, 22,22'-[(2,5-dibromo-1,4-phenylene)bis(oxy)]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

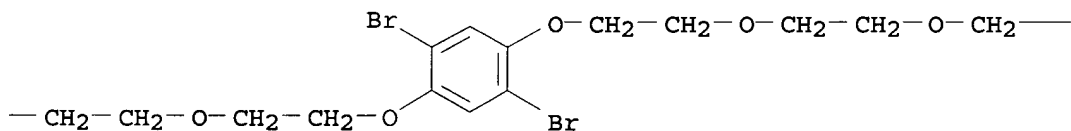
CRN 251479-79-5

CMF C36 H64 Br2 O16

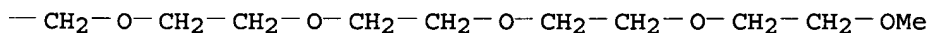
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PAGE 1-B



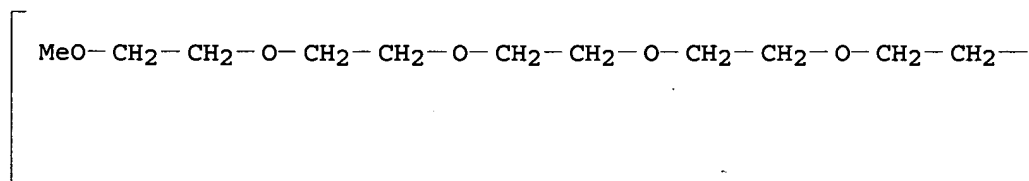
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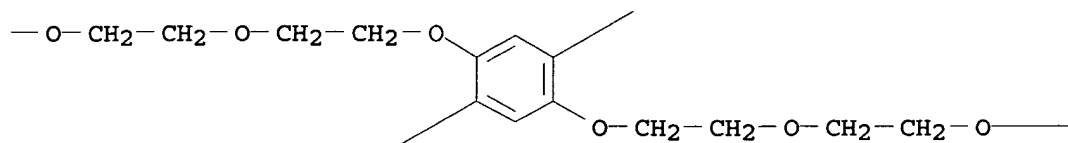
RN 251479-91-1 HCAPLUS

CN Poly[2,5-bis[(3,6,9,12,15,18,21-heptaoxadocos-1-yl)oxy]-1,4-phenylene] (9CI) (CA INDEX NAME)

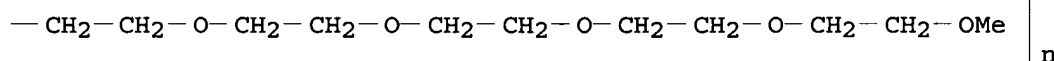
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PAGE 1-B



PAGE 1-C



L34 ANSWER 16 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1999:680636 HCAPLUS
 DN 132:12659
 TI Light-Emitting Electrochemical Cells from Oligo(ethylene oxide)-Substituted Polythiophenes: Evidence for in Situ Doping
 AU Johansson, T.; Mammo, W.; Andersson, M. R.; Inganaes, O.
 CS Laboratory of Applied Physics Department of Physics and Measurement Technology (IFM), University of Linköping, Linköping, S-581 38, Swed.
 SO Chemistry of Materials (1999), 11(11), 3133-3139
 CODEN: CMATEX; ISSN: 0897-4756
 PB American Chemical Society
 DT Journal
 LA English
 AB Electroluminescent (EL) and ion-conducting polythiophenes, poly(3-(2',5'-bis(1'',4'',7'''-trioxaoctyl)phenyl)thiophene) (I) and poly(3-(2'',5'''-bis(1''',4''',7''''-trioxaoctyl)phenyl)-2,2'-bithiophene) (II) were prepared and evaluated for use in light-emitting electrochem. cells (LEC). The oligo(ethylene oxide)-substituted polythiophenes mixed with a salt simultaneously act as a light-emitting layer and test solid-state electrolyte in LECs. Under an applied bias, p-doping of the electroluminescent polymer takes place at the anode. At the opposite electrode the cathode material is reduced. Since the work function of the electrode material is less important in an LEC, all-polymer devices, with poly(3,4-ethylenedioxythiophene) as anode and cathode, can be built. The doping processes were studied by in situ absorption spectroscopy in both sandwich configuration and on planar electrochem. cells.
 CC 36-5 (Physical Properties of Synthetic High Polymers)
 Section cross-reference(s): 74
 ST polythiophene ethylene oxide substituent prepn electroluminescence; ionic cond ethylene oxide polythiophene electrolyte; light emitting electrochem cell ethylene oxide polythiophene; photoelectrochem cell polythiophene oligoethylene oxide emitter
 IT Polymers, properties
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (conjugated, polythiophenes; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)

- IT Redox reaction
(electrochem.; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT Polymer electrolytes
(oxaocetylphenyl-substituted polythiophenes; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT Polymerization
(oxidative; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT Polymers, properties
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polythiophenes, oxaocetylphenyl-substituted; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT Conducting polymers
(polythiophenes; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT Ionic conductivity
Luminescence, electroluminescence
Photoelectrochemical cells
Work function
(redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT Electrochemistry
(spectroelectrochem.; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT 50926-11-9P, ITO 126213-51-2P, Poly(3,4-ethylene dioxythiophene)
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(electrode; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT 7791-03-9
RL: DEV (Device component use); USES (Uses)
(electrolyte component; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT 18720-49-5P, tert-Butylammonium perchlorate 33454-82-9P, Lithium triflate
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(electrolyte component; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT 121284-18-2P, 1,4-Bis(1',4',7'-trioxaocetyl)benzene 223655-06-9P, 2-Bromo-1,4-bis(1',4',7'-trioxaocetyl)benzene
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(intermediate; redox/doping process of oligo(ethylene oxide-phenyl)-substituted polythiophenes as electrolyte and emitter layer in photoelectrochem. cells)
- IT 223655-07-0P, 3-[2',5'-Bis(1'',4'',7'''-trioxaocetyl)phenyl]thiophene
223655-10-5P, 3-[2'',5'''-Bis(1''',4''',7''''-trioxaocetyl)phenyl]-2,2'-

bithiophene
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (monomer; redox/doping process of oligo(ethylene oxide-phenyl)-
 substituted polythiophenes as electrolyte and emitter layer in
 photoelectrochem. cells)

IT 7705-08-0, Iron chloride (FeCl₃), uses
 RL: CAT (Catalyst use); USES (Uses)
 (polymerization catalyst; redox/doping process of oligo(ethylene
 oxide-phenyl)-substituted polythiophenes as electrolyte and emitter
 layer in photoelectrochem. cells)

IT 14221-01-3, Tetrakis(triphenylphosphine)palladium
 RL: CAT (Catalyst use); USES (Uses)
 (redox/doping process of oligo(ethylene oxide-phenyl)-substituted
 polythiophenes as electrolyte and emitter layer in photoelectrochem.
 cells)

IT 223655-08-1P, 3-[2',5'-Bis(1'',4'',7''-
 trioxaocetyl)phenyl]thiophene homopolymer 223655-11-6P,
 3-[2'',5''-Bis(1''',4''',7'''-trioxaoctyl)phenyl]-2,2'-bithiophene
 homopolymer
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic
 preparation); PREP (Preparation); USES (Uses)
 (redox/doping process of oligo(ethylene oxide-phenyl)-substituted
 polythiophenes as electrolyte and emitter layer in
 photoelectrochem. cells)

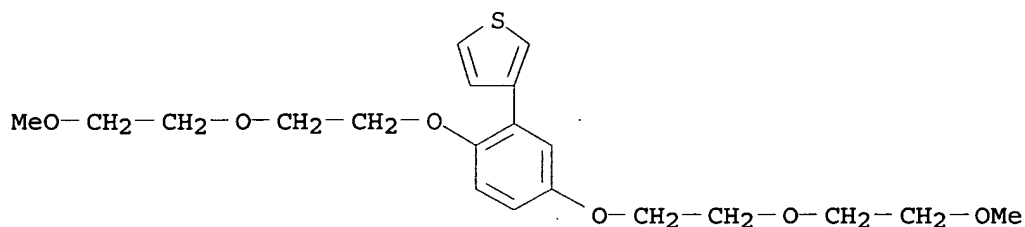
IT 109-72-8, n-Butyllithium, reactions 121-43-7, Trimethyl borate
 123-31-9, Hydroquinone, reactions 128-08-5, NBS 6165-69-1,
 3-Thiopheneboronic acid 19690-69-8, 3-Bromo-2,2'-bithiophene
 52808-36-3, 1-Chloro-2-(2-methoxyethoxy)ethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (redox/doping process of oligo(ethylene oxide-phenyl)-substituted
 polythiophenes as electrolyte and emitter layer in photoelectrochem.
 cells)

IT 223655-08-1P, 3-[2',5'-Bis(1'',4'',7''-
 trioxaoctyl)phenyl]thiophene homopolymer 223655-11-6P,
 3-[2'',5''-Bis(1''',4''',7'''-trioxaoctyl)phenyl]-2,2'-bithiophene
 homopolymer
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic
 preparation); PREP (Preparation); USES (Uses)
 (redox/doping process of oligo(ethylene oxide-phenyl)-substituted
 polythiophenes as electrolyte and emitter layer in
 photoelectrochem. cells)

RN 223655-08-1 HCAPLUS
 CN Thiophene, 3-[2,5-bis[2-(2-methoxyethoxy)ethoxy]phenyl]-, homopolymer
 (9CI) (CA INDEX NAME)

CM 1

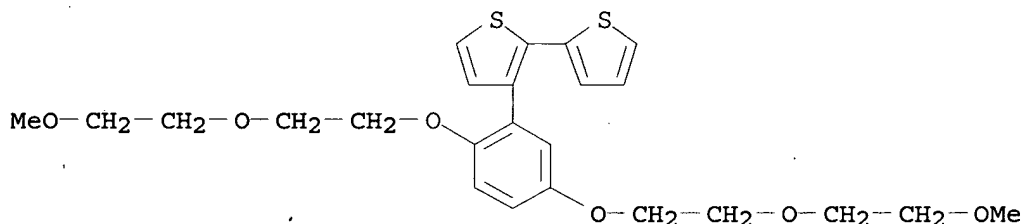
CRN 223655-07-0
 CMF C20 H28 O6 S



RN 223655-11-6 HCAPLUS
 CN 2,2'-Bithiophene, 3-[2,5-bis[2-(2-methoxyethoxy)ethoxy]phenyl]-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 223655-10-5
 CMF C24 H30 O6 S2



RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 17 OF 17 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1999:211141 HCAPLUS
 DN 130:352724
 TI Structure-property relationships of bis(ethylenedioxythienylnaphthalene) systems
 AU Sankaran, Balasubramanian; Tan, Loon-Seng
 CS Universal Technology Corporation, Dayton, OH, 45432-2600, USA
 SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (1999), 40(1), 189-190
 CODEN: ACPPAY; ISSN: 0032-3934
 PB American Chemical Society, Division of Polymer Chemistry
 DT Journal
 LA English
 AB Bis(ethylenedioxythienylnaphthalene) monomers were prepared and electrochem. polymerization was carried out to obtain electroactive conducting polymers.
 2,6-

Dihydroxynaphthalene was treated with trifluoromethanesulfonic acid anhydride in pyridine at 0° under argon to yield 2,6-trifluoromethanesulfonylnaphthalene (I); 2-(tributylstannyl)ethylenedioxythiophene (II) was synthesized using n-butyllithium and tributylstannylchloride; I was Still coupled with II in the presence of tetrakis(triphenylphosphine)palladium catalyst in 1,4-dioxane to yield the monomer, 2,6-bis(2-ethylenedioxythienyl)naphthalene (2,6-BEDOT)N. Similar sequence of reactions was used to prepare the other monomers, 1,5-bis(2-ethylenedioxythienyl)naphthalene (1,5-BEDOT)N, 1,5-dimethoxy-2,6-bis(2-ethylenedioxythienyl)naphthalene

- (1,5-DM-2,6-BEDOT)N, 1,5-dimethoxy-4,8-bis(2-ethylenedioxythienyl)naphthalene (1,5-DM-4,8-BEDOT)N, and 1,4,5,8-tetramethoxy-2,6-bis(2-ethylenedioxythienyl)naphthalene (1,4,5,8-TM-BEDOT)N. The monomers were electrochem. polymerized onto gold button or ITO electrodes and the redox behavior of the polymers was studied in monomer-free electrolyte solution and in-situ spectro-optoelectrochem. studies were carried out to determine the band gap. The band gap of the conducting polymers ranged from 2.2 eV to 3.4 eV; the (2,6-BEDOT)N polymer has a coplanar geometry, and is less sterically hindered as there are no methoxy groups to add to the strain of the mol. leading to a narrower band gap.
- CC 35-7 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 36, 72
- ST ethylenedioxythienyl naphthalene monomer prepn electrochem polymn;
conducting polymer ethylenedioxythienyl naphthalene band gap; mol
structure electroactive polymer ethylenedioxythienyl naphthalene
- IT Polymer chains
(conformation; preparation of bis(ethylenedioxythienylnaphthalene) monomers
and electrochem. polymerization and band gap-structure relations of
electroactive polymers)
- IT Polymerization
Redox reaction
(electrochem.; preparation of bis(ethylenedioxythienylnaphthalene) monomers
and electrochem. polymerization and band gap-structure relations of
electroactive polymers)
- IT Polymers, preparation
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polythiophenes, naphthalene-containing; preparation of
bis(ethylenedioxythienylnaphthalene) monomers and electrochem.
polymerization
and band gap-structure relations of electroactive polymers)
- IT Absorption spectra
Band gap
Conducting polymers
Molecular topology
Stille coupling reaction
(preparation of bis(ethylenedioxythienylnaphthalene) monomers and
electrochem. polymerization and band gap-structure relations of
electroactive
polymers)
- IT Electrochemistry
(spectroelectrochem.; preparation of bis(ethylenedioxythienylnaphthalene)
monomers and electrochem. polymerization and band gap-structure relations of
electroactive polymers)
- IT 225220-41-7P, 1,4,5,8-Tetramethoxy-2,6-bis(2-
ethylenedioxythienyl)naphthalene homopolymer
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(P(1,4,5,8-TM-BEDOT)N; preparation of bis(ethylenedioxythienylnaphthalene)
monomers and electrochem. polymerization and band gap-structure relations of
electroactive polymers)
- IT 225220-38-2P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(P(1,5-BEDOT)N; preparation of bis(ethylenedioxythienylnaphthalene) monomers
and electrochem. polymerization and band gap-structure relations of
electroactive polymers)
- IT 225220-39-3P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(P(1,5-DM-2,6-BEDOT)N; preparation of bis(ethylenedioxythienylnaphthalene)
monomers and electrochem. polymerization and band gap-structure relations of
electroactive polymers)
- IT 225220-40-6P, 1,5-Dimethoxy-4,8-bis(2-

- ethylenedioxythienyl)naphthalene homopolymer
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (P(1,5-DM-4,8-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphthalene)
 monomers and electrochem. polymerization and band gap-structure relations of
 electroactive polymers)
- IT 225220-37-1P
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (P(2,6-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphthalene) monomers
 and electrochem. polymerization and band gap-structure relations of
 electroactive polymers)
- IT 14221-01-3, Tetrakis(triphenylphosphine)palladium
 RL: CAT (Catalyst use); USES (Uses)
 (coupling catalyst; preparation of bis(ethylenedioxythienyl)naphthalene)
 monomers and electrochem. polymerization and band gap-structure relations of
 electroactive polymers)
- IT 225220-36-0P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (monomer, (1,4,5,8-TM-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphth
 alene) monomers and electrochem. polymerization and band gap-structure
 relations of electroactive polymers)
- IT 225220-33-7P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (monomer, (1,5-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphthalene)
 monomers and electrochem. polymerization and band gap-structure relations of
 electroactive polymers)
- IT 225220-34-8P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (monomer, (1,5-DM-2,6-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphth
 alene) monomers and electrochem. polymerization and band gap-structure
 relations of electroactive polymers)
- IT 225220-35-9P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (monomer, (1,5-DM-4,8-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphth
 alene) monomers and electrochem. polymerization and band gap-structure
 relations of electroactive polymers)
- IT 225220-32-6P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (monomer, (2,6-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphthalene)
 monomers and electrochem. polymerization and band gap-structure relations of
 electroactive polymers)
- IT 109-72-8, n-Butyllithium, reactions 358-23-6, Trifluoromethanesulfonic
 acid anhydride 581-43-1, 2,6-Dihydroxynaphthalene 1461-22-9,
 Tributylstannyl chloride 88818-38-6, 4,8-Dibromo-1,5-
 dimethoxynaphthalene 91394-96-6, 2,6-Dibromo-1,5-dimethoxynaphthalene
 123707-36-8, 2,6-Dibromo-1,4,5,8-tetramethoxynaphthalene
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of bis(ethylenedioxythienyl)naphthalene) monomers and
 electrochem. polymerization and band gap-structure relations of
 electroactive
 polymers)
- IT 175922-79-9P 225220-31-5P, 2,6-Trifluoromethanesulfonylnaphthalene*
 **
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (preparation of bis(***ethylenedioxythienyl)naphthalene) monomers and

electrochem. polymerization and band gap-structure relations of
electroactive
polymers)

IT 225220-41-7P, 1,4,5,8-Tetramethoxy-2,6-bis(2-
ethylenedioxythienyl)naphthalene homopolymer
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(P(1,4,5,8-TM-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphthalene)
monomers and electrochem. polymerization and band gap-structure relations of
electroactive polymers)

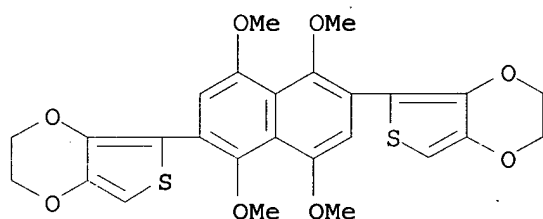
RN 225220-41-7 HCAPLUS

CN Thieno[3,4-b]-1,4-dioxin, 2,2'-(1,4,5,8-tetramethoxy-2,6-
naphthalenediyl)bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 225220-36-0

CMF C26 H24 O8 S2



IT 225220-39-3P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(P(1,5-DM-2,6-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphthalene)
monomers and electrochem. polymerization and band gap-structure relations of
electroactive polymers)

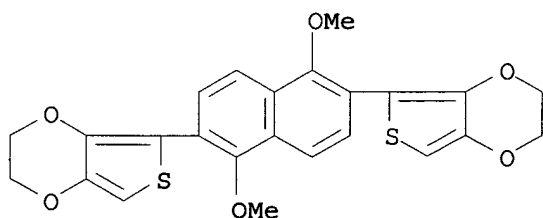
RN 225220-39-3 HCAPLUS

CN Thieno[3,4-b]-1,4-dioxin, 2,2'-(1,5-dimethoxy-2,6-naphthalenediyl)bis-,
homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 225220-34-8

CMF C24 H20 O6 S2



IT 225220-40-6P, 1,5-Dimethoxy-4,8-bis(2-
ethylenedioxythienyl)naphthalene homopolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(P(1,5-DM-4,8-BEDOT)N; preparation of bis(ethylenedioxythienyl)naphthalene)
monomers and electrochem. polymerization and band gap-structure relations of
electroactive polymers)

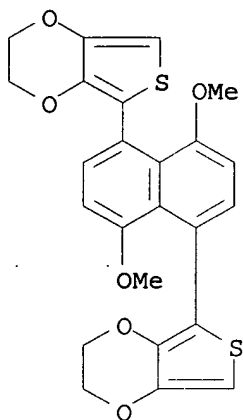
RN 225220-40-6 HCAPLUS

CN Thieno[3,4-b]-1,4-dioxin, 2,2'-(4,8-dimethoxy-1,5-naphthalenediyl)bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 225220-35-9

CMF C24 H20 O6 S2



RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> => D QUE

L7 SCR 2043
L12 SCR 1838 AND 2005
L14 SCR 1708
L16 STR

Ak @12

Cb—Cb G1—O—G2—O—G1
@8 @9 2 3 4 5 6

Ak—SO3H
@10 11

VAR G1=10/12
VAR G2=CB/8-3 9-5
NODE ATTRIBUTES:
CONNECT IS E2 RC AT 10
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 8

GGCAT IS UNS AT 9
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 10

STEREO ATTRIBUTES: NONE

L18 26582 SEA FILE=REGISTRY SSS FUL L16 AND L7 AND L12 AND L14
L19 15917 SEA FILE=HCAPLUS ABB=ON L18
L26 8 SEA FILE=HCAPLUS ABB=ON L19(L)?SULFO?(L)ELECTROLYT?
L27 2253 SEA FILE=REGISTRY ABB=ON L18 AND 1-5/S
L28 1338 SEA FILE=HCAPLUS ABB=ON L27
L29 10 SEA FILE=HCAPLUS ABB=ON L28(L)ELECTROLYT?
L30 14 SEA FILE=HCAPLUS ABB=ON L26 OR L29
L31 83833 SEA FILE=HCAPLUS ABB=ON ?SULFO?(3A)?ARYL? OR POLYPHENYL? OR
BIPHENYL? OR PHENYL? OR ?NAPHTHA? OR AROM?)
L32 357 SEA FILE=HCAPLUS ABB=ON L19 AND L31
L33 7 SEA FILE=HCAPLUS ABB=ON L32 AND ELECTROLYT?
L34 17 SEA FILE=HCAPLUS ABB=ON L30 OR L33
L37 576 SEA FILE=HCAPLUS ABB=ON L31(3A)?ETHER?(3A)?ALKYL?
L38 18 SEA FILE=HCAPLUS ABB=ON L37 AND ELECTROLYT?
L39 18 SEA FILE=HCAPLUS ABB=ON L38 NOT L34
L40 8 SEA FILE=HCAPLUS ABB=ON L39 AND ELECTROCHEM?/SC,SX
L41 14 SEA FILE=HCAPLUS ABB=ON L37(L)ELECTROLYT?
L42 7 SEA FILE=HCAPLUS ABB=ON L40 AND L41
L44 3 SEA FILE=HCAPLUS ABB=ON L41 AND ELECTRIC?/SC,SX
L45 9 SEA FILE=HCAPLUS ABB=ON L42 OR L44

=> D L45 BIB ABS IND HITSTR 1-9

Text search

L45 ANSWER 1 OF 9 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:98115 HCAPLUS

DN 140:149142

TI Cost-effective solid polymer **electrolyte** membranes,
membrane-electrode assembly, and fuel cells

IN Koyama, Toru; Morishima, Makoto; Nishimura, Shin

PA Hitachi Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 27 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|------|----------|-----------------|----------|
| PI | JP 2004039557 | A2 | 20040205 | JP 2002-197696 | 20020705 |
| PRAI | JP 2002-197696 | | 20020705 | | |
| AB | The membranes, useful for reformed gas-type fuel cells, direct methanol fuel cells, etc., comprise phenolic resins having (CH ₂) _n SO ₃ H (n = 1-3) groups. The phenolic resins may have alkyl ethers of phenolic OH. The polymer electrolytes show improved degradation resistance. | | | | |
| IC | ICM H01M008-02 ICS B01D053-22; B01D063-08; B01D071-78; C08G008-28; C08J005-22; H01M008-10; C08L061-14 | | | | |
| CC | 52-2 (Electrochemical , Radiational, and Thermal Energy Technology) Section cross-reference(s): 38, 76 | | | | |
| ST | solid polymer electrolyte alkylenesulfonic phenolic resin; formaldehyde phenol polymer sulfonation electrolyte membrane; | | | | |

membrane electrode assembly fuel cell polymer **electrolyte**;
 reformed gas methanol fuel cell polymer **electrolyte**

IT Phenolic resins, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (alkylenesulfonic acid-containing; cost-effective solid polymer
electrolytes comprising alkylenesulfonic acid-containing phenolic
 resins)

IT Fuel cell electrodes
 Fuel cell **electrolytes**
 Ionic conductors
 Membranes, nonbiological
 Polymer **electrolytes**
 (cost-effective solid polymer **electrolytes** comprising
 alkylenesulfonic acid-containing phenolic resins)

IT Polysulfones, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (phenolic-, sulfo-containing, having alkylenesulfonic acid; cost-effective
 solid polymer **electrolytes** comprising alkylenesulfonic
 acid-containing phenolic resins)

IT Phenolic resins, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-, sulfo-containing, having alkylenesulfonic acid;
 cost-effective solid polymer **electrolytes** comprising
 alkylenesulfonic acid-containing phenolic resins)

IT Fuel cells
 (solid **electrolyte**; cost-effective solid polymer
electrolytes comprising alkylenesulfonic acid-containing phenolic
 resins)

IT Phenolic resins, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (sulfo-containing, having alkylenesulfonic acid; cost-effective solid
 polymer **electrolytes** comprising alkylenesulfonic acid-containing
 phenolic resins)

IT 9003-35-4DP, Formaldehyde-phenol copolymer, alkylenesulfonic acid-containing
 24969-11-7DP, Formaldehyde-resorcin copolymer, alkylenesulfonic
 acid-containing 25053-88-7DP, p-Cresol-formaldehyde copolymer,
 alkylenesulfonic acid-containing 25086-36-6DP, m-Cresol-formaldehyde
 copolymer, alkylenesulfonic acid-containing 25359-91-5DP,
 Formaldehyde- α -naphthol copolymer, alkylenesulfonic acid-containing
 26300-31-2DP, Phenol, 4,4'-methylenedi-, polymer with formaldehyde,
 alkylenesulfonic acid-containing 26338-61-4DP, Furfural-phenol copolymer,
 alkylenesulfonic acid-containing 27775-64-0DP, Formaldehyde-4,4'-
 dihydroxydiphenyl sulfone copolymer, alkylenesulfonic acid-containing
 28428-94-6DP, alkylenesulfonic acid-containing 52539-15-8DP, Allyl
phenyl ether-formaldehyde copolymer,
 alkylenesulfonic acid-containing 106176-86-7DP, alkylenesulfonic
 acid-containing 146027-49-8DP, Allyl phenol-formaldehyde copolymer,
 alkylenesulfonic acid-containing 652129-11-8DP, alkylenesulfonic
 acid-containing
 652129-14-1DP, alkylenesulfonic acid-containing
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (cost-effective solid polymer **electrolytes** comprising
 alkylenesulfonic acid-containing phenolic resins)

AN 2002:344956 HCAPLUS

DN 136:378560

TI Application of **alkyldiphenyl ether sulfonates**
and **alkyldinaphthalene ether sulfonates**,
electrically conductive polymer materials, and solid **electrolytic**
capacitors

IN Tatsuzono, Fumio; Hirata, Yoshikazu; Kamikawa, Hidenori

PA Sanyo Denshi Buhin K. K., Japan; Sanyo Electric Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 2002128877 | A2 | 20020509 | JP 2000-323661 | 20001024 |
| PRAI | JP 2000-323661 | | 20001024 | | |

OS MARPAT 136:378560

AB **Alkyldiphenyl ether sulfonates** and
alkyldinaphthalene ether sulfonates are useful
as dopants for elec. conductive polymers such as polypyrrole,
polythiophene, and polyfuran. Elec. conductive polymer materials containing
the polymers and dopants, and solid **electrolytic** capacitors
using the materials are also claimed. Thus, a polypyrrole film showing
elec. resistivity 0.10 and 0.33 Ω -cm initially and after 40-h
storage at 150°, resp., was prepared by **electrolytic**
polymerization of pyrrole in the presence of disodium dodecyldiphenyl ether
disulfonate as a dopant.

IC ICM C08G061-12

ICS H01G009-028

CC 76-10 (**E**lectric Phenomena)

Section cross-reference(s): 38

ST **alkyldiphenyl ether sulfonate** dopant polymeric conductor;
alkyldinaphthalene ether sulfonate dopant
conductive polymer; solid **electrolytic** capacitor polymer
conductor dopant; heat resistance elec conductor polypyrrole dopant

IT Heat-resistant materials
(conductive polymers; elec. conductive polymers using
alkyldiphenyl ether sulfonates or
alkyldinaphthalene ether sulfonates as
dopants for solid **electrolytic** capacitors)

IT Dopants
Polymer **electrolytes**
(elec. conductive polymers using **alkyldiphenyl ether**
sulfonates or **alkyldinaphthalene ether**
sulfonates as dopants for solid **electrolytic**
capacitors)

IT Conducting polymers
(polyfurans; elec. conductive polymers using **alkyldiphenyl**
ether sulfonates or **alkyldinaphthalene**
ether sulfonates as dopants for solid
electrolytic capacitors)

IT Ionic conductors
(polymeric; elec. conductive polymers using **alkyldiphenyl**
ether sulfonates or **alkyldinaphthalene**
ether sulfonates as dopants for solid
electrolytic capacitors)

IT Conducting polymers
(polypyrroles; elec. conductive polymers using **alkyldiphenyl**
ether sulfonates or **alkyldinaphthalene**

- ether sulfonates** as dopants for solid electrolytic capacitors)
- IT Conducting polymers (polythiophenes; elec. conductive polymers using **alkyldiphenyl ether sulfonates** or **alkyldinaphthalene ether sulfonates** as dopants for solid electrolytic capacitors)
- IT Electrolytic capacitors (solid; elec. conductive polymers using **alkyldiphenyl ether sulfonates** or **alkyldinaphthalene ether sulfonates** as dopants for solid electrolytic capacitors)
- IT 30604-81-0P, Polypyrrole
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (elec. conductive polymers using **alkyldiphenyl ether sulfonates** or **alkyldinaphthalene ether sulfonates** as dopants for solid electrolytic capacitors)
- IT 613-80-9D, 2-Naphthyl ether, alkyl and sulfo derivs., salts 25619-63-0D, sulfonated, sodium salt 28519-02-0, Disodium dodecyldiphenyl ether disulfonate 51506-28-6 163816-26-0, Disodium butyldiphenyl ether disulfonate
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses) (elec. conductive polymers using **alkyldiphenyl ether sulfonates** or **alkyldinaphthalene ether sulfonates** as dopants for solid electrolytic capacitors)
- IT 25067-54-3, Polyfuran 25233-34-5, Polythiophene
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses) (elec. conductive polymers using **alkyldiphenyl ether sulfonates** or **alkyldinaphthalene ether sulfonates** as dopants for solid electrolytic capacitors)

L45 ANSWER 3 OF 9 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1996:83099 HCAPLUS

DN 124:217991

TI Manufacture of laminated ceramic capacitor

IN Anho, Tamiko; Ootsuki, Etsuo

PA Tokin Corp, Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 07307241 | A2 | 19951121 | JP 1994-124437 | 19940513 |
| PRAI | JP 1994-124437 | | 19940513 | | |

AB In the manufacture of the capacitor having a 3-layered external electrode (undercoating layer, intermediate layer, outer layer) the intermediate layer of the external electrode is formed by **electrolytic** plating using a solution containing a surface active agent. The surface active agent is selected from **alkylnaphthalenesulfonic acid salt**, **dialkylsulfosuccinic acid salt**, **alkyldiphenyl ether disulfonic acid salt**, **alkylphosphoric acid salt**, and a naphthalenesulfonic acid-formaldehyde condensed compound The

intermediate layer prevents permeation of a plating solution into a capacitor element.

IC ICM H01G004-12

ICS H01G004-252; H01G004-30

CC 76-10 (Electric Phenomena)

ST laminated ceramic capacitor external electrode; ceramic capacitor external electrode plating; surface active agent ceramic capacitor

IT Electric capacitors

(laminated ceramic; external electrode formation using plating solution containing surface active agent in manufacture of laminated ceramic capacitors)

IT 1321-69-3D, Sodium naphthalenesulfonate, alkyl derivative 7632-05-5D, Sodium phosphate, alkyl derivative 20526-58-3D, dialkyl derivative 25155-19-5D, Naphthalenesulfonic acid, condensed compound with formaldehyde 51506-28-6D, alkyl derivative

RL: TEM (Technical or engineered material use); USES (Uses)

(external electrode formation using plating solution containing surface active agent in manufacture of laminated ceramic capacitors)

L45 ANSWER 4 OF 9 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1995:733315 HCAPLUS

DN 123:118541

TI Long cycle life and shelf life secondary alkaline batteries

IN Shibata, Yoshiho; Morishita, Nobuyasu; Matsuda, Hiromu; Ikoma, Munehisa

PA Matsushita Electric Ind Co Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 07130392 | A2 | 19950519 | JP 1993-271831 | 19931029 |
| PRAI | JP 1993-271831 | | 19931029 | | |

AB The batteries contains a sulfone group containing surfactant. The surfactant is selected from alkyl di-Ph ether disulfonate salts, alkyl naphthalenesulfonate salts, dialkyl sulfosuccinate salts, glycol ether sulfonate salts, alkylaryl sulfonate salts, and polyethylene nonylphenyl ether sulfonate salts; and can be used for hydrophilic treatment of battery separators, added to battery electrolyte, or coated on battery anodes. The batteries are preferably Ni/H batteries.

IC ICM H01M010-26

ICS H01M002-16; H01M004-24; H01M010-30

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nickel hydrogen battery sulfone surfactant

IT Batteries, secondary

Surfactants

(sulfone group containing surfactant additives for nickel/hydrogen batteries)

IT 27154-83-2D, Diphenyl ether disulfonic acid, alkyl derivative, sodium salt

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(sulfone group containing surfactant additives for nickel/hydrogen batteries)

L45 ANSWER 5 OF 9 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1992:155452 HCAPLUS
 DN 116:155452
 TI Sealed lead-acid batteries
 IN Hayashi, Toshiaki
 PA Japan Storage Battery Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 3 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---------------|------|----------|-----------------|----------|
| PI | JP 03241671 | A2 | 19911028 | JP 1990-37680 | 19900219 |
| | JP 2958790 | B2 | 19991006 | | |
| PRAI | JP 1990-37680 | | 19900219 | | |

AB The batteries have powdered SiO₂ filled in and around their electrode-separator stacks for retaining a H₂SO₄ **electrolyte** containing an acid-resistant penetrating agent. **Alkyl di-Ph ether disulfonates** were used as the penetrating agent in examples. The additives shortens the time required for the impregnation of H₂SO₄ into SiO₂.

IC ICM H01M010-10

ICS H01M010-12

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

ST lead battery **electrolyte** penetration agent; phenyl ether sulfonate lead battery **electrolyte**

IT Penetrating agents

(oxidation-resistant, **alkyl di-Ph ether disulfonate**, for sulfuric acid **electrolyte**, in sealed lead-acid batteries)

IT Battery **electrolytes**

(sulfuric acid, **alkyl di-Ph ether sulfonate** penetrating agents for)

IT Batteries, secondary

(sealed, lead, penetrating agent-containing sulfuric acid for)

IT 27154-83-2D, alkyl derivs., salts

RL: TEM (Technical or engineered material use); USES (Uses)

(penetrating agent, in sulfuric acid, for sealed lead-acid batteries)

L45 ANSWER 6 OF 9 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1987:586012 HCAPLUS

DN 107:186012

TI High-purity **electrolytic** iron

IN Minami, Seiichiro; Kimura, Yoshiaki; Tanaka, Yoshio

PA Showa Denko K. K., Japan

SO Jpn. Kokai Tokkyo Koho, 2 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|-------------|------|----------|-----------------|----------|
| PI | JP 62161980 | A2 | 19870717 | JP 1986-752 | 19860108 |
| | JP 06053945 | B4 | 19940720 | | |
| PRAI | JP 1986-752 | | 19860108 | | |

AB A method for preparing high-purity **electrolytic** Fe using a bath containing ferrous ions involves adding surfactant to the bath to control H generation. Optionally, the surfactant may be comprised of Na **naphthalene-type sulfonate** or polyoxyethylene

alkyl ether.

IC ICM C25C001-06

CC 72-8 (**Electrochemistry**)

ST **electrolytic** iron surfactant

IT Surfactants
(hydrogen-generation control by, in preparation of **electrolytic** iron)

IT 7439-89-6P, Iron, preparation
RL: PREP (Preparation)
(preparation of, surfactants for **electrolytic**, for hydrogen-generation control)

IT 9008-63-3, Lavelin 69431-55-6
RL: PRP (Properties)
(surfactants, in controlling of hydrogen generation in preparation of **electrolytic** iron)

L45 ANSWER 7 OF 9 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1973:437944 HCAPLUS

DN 79:37944

TI Antipitting action of some surface-active agents

AU Parlapanski, M.; Mutaftchiev, Ts.

CS Bulg.

SO Godishnik na Visshiya Khimikotekhnologicheski Institut, Sofiya (1971), Volume Date 1969, 16(2), 263-72
CODEN: GVKIAH; ISSN: 0489-6211

DT Journal

LA Bulgarian

AB The surface tension, wetting power, detergent or emulsifying efficiency, and foam forming ability of antipitting additives conventionally used in Ni electroplating baths were investigated to determine which property is responsible for the antipitting effect. All investigations were performed with 0.5 g/l. of the organic additives in a conventional Watts Ni-plating bath using classical methods. The following compds. were tested: sulfonated fatty alcs. (C8-18; **alkylnaphthalenesulfonic acid; alkylarylsulfonic acid; alkylphenolpolyglycol ether**), Na salt of CM-cellulose, and ammonium salts of sulfonated polyalkylbenzenes. Detailed data are tabulated and compared. The decrease of surface tension at the metal/solution interface does not determine the antipitting activity, since some of the powerful antipitting additives do not alter surface tension at all. Because all investigated additives have in common a drastic increase of the detergent power of the **electrolyte** (up to 2-3 orders of magnitude) the better washing out of organic impurities on the cathode surface decreases the hydrophobic effect, hence no gas bubbles are continuously attached to the metal surface during plating and pitting is suppressed.

CC 77-6 (**Electrochemistry**)

ST antipitting action surfactant; nickel electroplating antipitting agent

IT Sulfonic acids, uses and miscellaneous
RL: USES (Uses)
(alkylaryl and hydroxy, in nickel electroplating, antipitting action of)

IT Polyoxyalkylenes
RL: USES (Uses)
(alkylphenyl ethers, in nickel electroplating, antipitting action of)

IT Surfactants
(in electroplating, of nickel, antipitting action of)

IT 7440-02-0, uses and miscellaneous
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(electroplating of, antipitting action of surfactants in)

IT 25155-19-5D, Naphthalenesulfonic acid, alkyl derivs.
 RL: PRP (Properties)
 (in electroplating, antipitting action in nickel)
 IT 98-11-3D, Benzenesulfonic acid, polyalkyl 2386-53-0 9004-32-4
 RL: PROC (Process)
 (in electroplating, of nickel, antipitting action of)

L45 ANSWER 8 OF 9 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1969:445135 HCAPLUS
 DN 71:45135
 TI Electrodes for aqueous alkali metal chloride **electrolytes**
 IN Lee, Denis
 PA Imperial Chemical Industries Ltd.
 SO Ger. Offen., 12 pp.
 CODEN: GWXXBX
 DT Patent
 LA German
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---------------|------|----------|-----------------|----------|
| PI | DE 1807150 | B2 | 19770707 | DE 1968-1807150 | 19681105 |
| | GB 1237077 | A | 19710630 | GB 1967-51218 | 19671110 |
| | US 3592750 | A | 19710713 | US 1968-769377 | 19681021 |
| | FI 49324 | B | 19750131 | FI 1968-3033 | 19681025 |
| | BE 723575 | A | 19690508 | BE 1968-723575 | 19681108 |
| | NL 6815925 | A | 19690513 | NL 1968-15925 | 19681108 |
| | NL 159145 | B | 19790115 | | |
| | FR 1594758 | A | 19700608 | FR 1968-1594758 | 19681108 |
| PRAI | GB 1967-51218 | A | 19671110 | | |

AB A process is described for the preparation of an electrode consisting of a Ti carrier and a Pt coating **electrolytically** deposited upon the Ti.
 The electrodes so prepared are useful in the electrolysis of aqueous alkali metal chlorides. The process is characterized by the deposition of the Pt in a bath containing 1-2 g./l. of a compound which suppresses the maximum of polarographic waves and which does not react with the Pt compds. in an **electrolytic** bath. The additives can be, for example, agar-agar, gum arabic, high-mol.-weight poly(ethylene glycol), the Na salt of a long chain **alkylbenzenesulfonate** or of an **alkylaryl polyethersul-fonate**.

IC B01K
 CC 77 (**Electrochemistry**)
 ST electrodes electrolysis Na chloride; electrolysis Na chloride electrodes; titanium Pt electrodes electrolysis; sodium chloride electrolysis electrodes
 IT Alkali metal chlorides
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (electrolysis of, platinum-coated titanium electrodes for)
 IT Electrodes
 (for alkali metal chlorides, titanium with platinum coating)
 IT 7440-32-6, uses and miscellaneous
 RL: USES (Uses)
 (electrodes, platinum-coated for alkali metal chlorides)

L45 ANSWER 9 OF 9 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1948:36104 HCAPLUS
 DN 42:36104
 OREF 42:7646c-i,7647a
 TI **Electrolytic** formation of azo dyes in facsimile recording
 IN Solomon, Myer
 PA Radio Corp. of America

DT Patent
LA Unavailable
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|--|------|----------|-----------------|------|
| PI | US 2440526 | | 19480427 | US | |
| AB | <p>Solns. or mixts. are described, consisting of a diazotizable amine (I) and an ionizable nitrite (II) which are adapted for electrolytic reaction to produce a diazonium compound, which in turn forms an azo dye by reaction with a coupling component (III) present in the reaction mixture. Another object of the invention is the preparation of supporting surfaces or carriers by saturating or impregnating a suitable material (paper, all-rag sheet, etc.) with the appropriate solution, the supporting surface being then adapted for electrolytic facsimile recording through azo dye formation. The ingredients of the mixture consist of I, II, an alkali, III, an electrolyte, H₂O or other solvents in which electrolytes ionize, and other minor components. Typical mixts. are (figures in parentheses are amts. of substance per l. of solution): 3,3'-benzidinedisulfonic acid (IV) (6.538 g.), acetoacetanilide (0.354 g.), Schaeffer's salt (0.924 g.), chromotropic salt (V) (4.995 g.), Na dithionite (VI) (0.630 g.), urea (0.600 g.), NaCl (VII) (26.30 g.), NaOH (VIII) (2.44 g.), NaNO₂ (IX) (4.14 g.), and the Na salt of an aryl alkyl polyether sulfonate (0.8 g.); IV (6.538 g.), V (6.000), barbituric acid (0.512 g.), VI (0.588 g.), dicyanodiamide sulfate (0.316 g.), thiourea (0.076 g.), Na₂CO₃ (3.721 g.), VII (17.536 g.), VIII (20.0 ml. of 2.5 N) and IX (14.8 ml. of 5.0 M); o-tolidine-2,2'-disulfonic acid (5.054 g.), V (3.640 g.), VIII (52 ml. of 1 N), IX (15 ml. of 2 N), and VII (52.5 g.); Na naphthionate (7.352 g.), phloroglucinol (1.260 g.), VIII (40 ml. of 1 N), IX (15 ml. of 2 N), and VII (58.5 g.); 4-acetyl-amino-1,7-Cleve's acid (9.228 g.), gamma acid (2.390 g.), VIII (70 ml. of 1 N), IX (15 ml. of 2 N) and VII (25.6 g.). Examples of useful pairs of amines and couplers are 4-aminobenzenesulfonic acid (X) and 1,3,5-trihydroxybenzene (XI), X and Na 2-naphthol-6-sulfonate (XII), X and di-Na 2-naphthol-3,6-disulfonate (XIII), X and di-Na 2-naphthol-6,8-disulfonate (XIV), Na 3-methyl-4-aminobenzenesulfonate and 2-hydroxy-3-naphthoic acid (XV), 4,4'-diamino-2,2'-biphenyldisulfonic acid (XVI) and XI, XVI and XV, XVI and XII, XVI and XIII, 4,4'-diamino-3,3'-dimethyl-6,6'-disulfobiphenyl (XVII) and 3-diethylaminophenol (XVIII), 4,4'-diamino-5,5'-dimethyl-2,2'-disulfobiphenyl (XVIIA) and XVIII, XVII and XII, XVIIA and XII, XVII and XIII, XVIIA and XIII, Na 1-naphthylamine-4-sulfonate (XIX) and 2,4-dihydroxyphenyl Me ketone, Na 1-naphthylamine-4-sulfonate (XX) and XI, XX and XVIII, XIX and 1-hydroxy-2-naphthoic acid (XXI), XIX and 2-naphthol (XXII), XIX and XII, XIX and 8-hydroxyquinoline (XXIII), 1-naphthylamine-5-sulfonic acid and XXIII, 2-naphthylamine-1-sulfonic acid (XXIV) and XI, XXIV and XXI, XXIV and XXII, XXIV and XV, 2-naphthylamine-4,8-disulfonic acid and XIII, 2-naphthylamine-6,8-disulfonic acid (XXV) and XI, XXV and XVIII, XXV and XXI, XXV and XXII, XXV and XII, XXV and 2-naphthol-8-sulfonic acid, XXV and XIII, and XXV and XXIII. A pH of 9-11.5 is preferred since the color intensity is not sacrificed unduly for gain in background permanence. V is considered to be the best all-round coupling compound Cf. C.A. 37, 2999.5; 42, 4072i.</p> | | | | |
| CC | 4 (Electrochemistry) | | | | |
| IT | Dyes | | | | |
| | (azo, electrolytic formation in facsimile recording) | | | | |
| IT | Recording | | | | |
| | (facsimile, with azo dyes) | | | | |
| IT | Pyrimidine, 2-(6-bromo-2-naphthylamino)-4-(2-diethylaminoethylamino)-6-methyl-, dihydrochloride | | | | |

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